262 826 All food was also made up of the 4 elements. Here rice was of particular importance. The body was seen as built and maintained by rice. Flesh in fact was rice, an image probably derived from Buddhist scriptures.[11]

82 Each element carried with it its substantive aspect of heat, flowing, etc., and its astrological nature and relations. Elements could be compatible or incompatible with each other. Earth, water, wind, iron, and wood for instance were compatible. Gold "got along" with all elements. Fire, though, was incompatible with wind, water, and wood for it could destroy their proper proportion.

828 787 The effect of astral and planetary relationships at the moment of birth on one's constituent elements induced qualities of character.[12] Mind and body were a continuum. Because family members were born at different moments of time, intrafamilial temperamental differences were expected.[13] Persons made up of incompatible elements quarreled. Thus, friction might occur between parents and children. For a husband and wife, who lived in especially close proximity, the constitutional elements were of special importance. Through marital relationships their elements were in physical contact. Consequently, in the old days, a couple contemplating marriage ascertained through their horoscopes the compatibility of their natal elements to determine whether they could live together without destroying each other. For instance, a girl with much fire in her make-up was easily angered and prone to fevers. She could not make a successful marriage with a boy with much wood.

Physiology

753 826 [827] A single physiological process controlled the functioning of the body and the mind; i.e., the equilibrium of its elements. If the elements were in proper balance, proportion or harmony, a person was healthy; if an element were excessive or deficient,

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[11] "This, my formed body, is composed of the 4 Elements, generated by Father and Mother, built up from rice, porridge and sour gruel," says the Buddha (Suriyabongse 1951:11).

[12] Merit, the other determinant of character, is discussed in "Influences on Health" below.

[539] [13] Cf. the proverb "The joints (knots) on the same stem are nevertheless unequally spaced, so even brothers are of different minds," (Gerini 1904:14).

753 826 a condition which also affected the functioning of the others, he was ill or emotionally disturbed.[14] For example, dropsy, swelling, and yellow eyes came from excess water; cholera and constipation from earth mists. Wind and fire were the great trouble-makers.

Wind "was stronger than the other three elements." Either blowing wind or still air easily penetrated the skin and caused difficulties all the way from flatulence, stomach-ache and diarrhea to a minor head-ache and dizziness ("if wind whirls inside the body, the house swims around"); from incessant crying to serious interference with breathing, hence fainting and death. An accident, such as a cut or broken bone, disturbed, and might "let out," the air. Acute pain ensued if "rigidity" of earth, fire, or water interfered with the proper movements of the internal winds.

828 826 Anger and fever were both in the category of excess fire. Since fire was particularly implicated in disturbed social relations, coolness was emphasized as the desirable state of body and mind. The blessings for both sexes at birth and at the marriage ceremonies enjoined the individual to be "cool and happy." There was some evidence that cool natures were tender (on) natures. Since women by nature were assumed to be "tender," and men not, a difference in element constitution may have been sex-linked. However, everyone knew of women who were not tender. For persons abundantly endowed with fire, temper control through temperature control was a constant preoccupation, for the allowable margin of fluctuation was especially narrow.

262 826 Food occupied an especially important place in a person's welfare because food controlled the fire element.[15] The following material on diet is the background for some of the dietary injunctions during pregnancy and lactation.

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[14]. In view of Thailand's ancient Indian contacts, the parallels (and differences) between Bang Chan, and Hindu Ayurvada as described by Opler (1963:32-35), are noteworthy. [177]

[15]. "What was drunk or eaten by its decaying created the fire element in the body" (Suriyabongse 1954:12).

Diet in Body Maintenance and Curing

261 262 753 Because food created fire, the daily diet could be a source of illness or a therapeutic means. Every food had known properties for heating or cooling, and for other effects as well. Guava fruit, alcohol, and turtle or cobra curry were heating. Eggs were cooling. Depending on the occasion, ice and iced concoctions were over-heating or over-cooling. They were always "dangerous during menstruation." Banana varied according to the variety: *kluai hōm* (fragrant banana) was undesirably cooling and caused either diarrhea or constipation (Hauck, 1959:27); *kluāi nam wā* was less deleterious (*salāeng*) while *kluāi nam* was good for the sick or for parturients (Boonlong).

252 262 [758] [846] Properties in food changed in cooking. Boiling made rice "ripe" (*suk*) and so available as nourishment (Anuman Rajadhon:77). Even the method of cooking varied the properties. For the sick and for parturients, the banana variety called *kluāi hak muk* was good if baked, but not if cooked in syrup (Boonlong).

262 753 827 Some foods were "incompatible" with, and so aggravated, certain illnesses. Air-borne food in the form of smell was incompatible with, and compounded, a condition of wind excess. Death or blindness ensued. On the other hand, asafetida might be tied to the wrist of a new-born baby so that the smell, an established carminative, might cure the excess wind in his stomach manifested as flatulence.

262 Beneficial foods were encouraged. Of all these none surpassed rice, the main sustenance of the body, "the only true food" (Yong Chutima, in Hauck, 1959:27) and source of "strength" to the farmer. Rice was a safe food. It never disturbed elements. Eating rice, as compared with meat, had no overtone of taking life. One could eat one's fill without any sin. [774] Most of all, rice nourished the human *khwan*, for each grain contained a part of the *khwan* of the divine Rice Mother. [782] Furthermore, any food offered ritually to a spirit or to make merit acquired strengthening properties, and was afterwards given to priests, children, or to the sick.

[776] Foods with known dangers were avoided. "*Kluāi tānī* banana, a variety full of seeds, was never eaten because it contained a female ghost (*phi*)." Jackfruit was avoided by lactating women as a direct source of wind-excess. Fruit in general was not dangerous but "did not give enough strength for a rice farmer. It was all right for an orchardist."

People used their knowledge of food properties to ameliorate 262 •
their physical condition. During lactation, for instance, women [853]
ate vegetables or not "depending on the condition of the baby,"
for breast milk was very easily affected by adverse properties.
In the broader context of general dietary needs, people enter-
tained ideas about the suitability of certain foods to certain
ages, sexes, occupations, conditions, and occasions (Hauck, et al:
42-50). Nevertheless, persons often risked an undesirable effect [824]
in food for pleasure. The proper banana variety for ritual use
was the tiny kluai nam, yet it was not planted much in Bang Chan [245]
because the people "did not like the taste." They substituted
the "pleasant-tasting" kluai nam wā. Here orthodoxy came off
second. The heat of alcoholic drink relished by men and older 273
women often pressed the margin of safe temperature control. The 262
cobra--turtle--or chicken--plus--alcohol feasts exemplified
how readily the elders gambled even on the increment of sin from 261
eating meat, or risked an over-heated temper, for the joy of eat-
ing such cherished delicacies.

Food dislikes, if temporary, reflected an imbalance of 262
elements; if usual, an individual constitutional set of the
person's elements. To eat disliked food was therefore positively
harmful. To urge someone to eat disliked food was wrong.[16]

Illness

All illness, anxiety, and soul loss was caused by intrusions 753
from outside the body. The intrusion might be from a super-
natural source (wisēt:powerful) or natural (tām thammachāt)
(Textor:10) but in either case the result was the same: disrup-
tion of the elements. Anxiety, whether caused by a social
situation such as fear of frustration, by a broken bone or by a 828
fever, also was a disruption of balance. An attack by the
supernatural disease missile, "khun"[17] gave rise to the classic 753
symptoms of wind-excess: "a man cried all the time and had
flatulency." Elements were also disorganized by spirit attack.
The victim suffered hysteria, paroxysm, flatulence, convulsion,

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[16] Phillips (p. 65) reported that parents did not give their [757]
child a disliked medicine because "it offends him.... It is [855]
better not to give it to him than hurt his feelings."

[17] This small skin missile invaded the body and then expanded [754]
to the size of a buffalo. Intentional attack (sorcery) might
kill; accidental, merely pained (cf. Textor:116-127). Sus-
pected khun was one of the few reasons why a family would
authorize so grave a violation of the body of a deceased
member as an autopsy.

828 or fainting, and also such localized trauma as abcesses.
Similar behavior followed the influence of malevolent magical
753 amulets, incantations, and love magic. Natural intrusions
may be exemplified by the seasonal influences of rain, which
brought on too much water element; of heat, which increased
fire; and of wind, which cooled too much or brought in
certain fevers, e.g. north fever (khai nūa). An accident was
a natural cause of disequilibrium. A cut might let out the
air or a soul.

774 Any lost soul, if not restored, meant death. Souls were
lost from falls or frights or from spirit attack, a condition
[761] recognized by persistent crying, hysteria, and unconsciousness.
The exits were at the top of the head, the palms of the hands,
[753] and the soles of the feet, the latter 2 sometimes localized
at the 2 thumbs and the 2 great toes. One of the old beliefs
associated an element with one of the four čhittaphūt souls
(Textor:130). When one of these souls was lost one whole
element was gone. Loss of the khwan soul was more frequent
than any other, especially during childhood. Its care
[844] throughout life was very much in mind. The khwan[18] played an
especially prominent part during childbirth.

755 If a person were only slightly sick, he might first try
[262] to overcome his physical complaint by attention to diet.
Very rarely did he by himself buy some medicine at a drug
[757] store. If it were a case of a child's lost khwan, women
performed the rite for its recovery. When the khwan of an
adult was affected, men performed a strengthening rite (tham
khwan), or a priest gave a holy water bath. If the person
were very ill, holy cotton thread (sāi sin) was tied at
wrist, ankle, and neck so as to shut off the soul exits. An
elder relative or spouse might also "bon," i.e. vow food or
liquor in return for the help of supernatural beings; or,
with Buddhist "sacred things" in mind, promise the ordination
of the afflicted person, or oneself, or some interested
relative. In this case, the relatives had long since turned
for help from the arts of medicine.

278 The Arts of Medicine

755 Medical knowledge comprised on the one hand a pharmacology
of materia medica, and on the other, the far more important

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[18] The conceptualization of this soul was Brahmanic in
source, rather than Buddhist (cf. Martinie, 1952:370).

On the other hand, pregnancy was a period of uncertainty 843
when a woman was easily upset emotionally. Because childbirth
was "like a war" when a woman might die, "defeated by her
pregnancy"(phaethong), she felt uneasy.[24] If she were
frightened, her child's khwan would fly off in terror. The 843
baby died in the womb if its khwan did not return. Because 753
of increased sensitivity and vulnerability her elements and
those of the baby were frequently thrown off balance. Wind
easily entered through the thin skin of her stomach where she
carried the unborn child. It caused pre-natal disorders all
the way from queasiness and minor vomiting in early pregnancy
to miscarriage and death. "A woman felt dizziness and numbness
because of wind in the fetus. In a month she suffered a
miscarriage."

A pre-natal pain that did not seem to be a labor-pain was
diagnosed as the very dangerous naem, "a thick lump of blood [757]
and wind that moved quickly." As in other illnesses, element
harmony was restored by medicines, holy water, and by modifi- [755]
cations of diet. [262]

Women knew of possible supernatural invasions of the womb 843
during pregnancy. If a woman had beforehand lost a baby at
birth or through miscarriage, and the body had not been
properly buried, she might be seriously troubled by its rest- [775]
less ghost, fully as powerful, it must be remembered, as an
adult's.

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[24] The image of battle was traditional (cf. Anuman Rajadhon: 108). Phaethong (McF: 599), a combination of food craving and vomiting (Anuman Rajadhon: 115) paralleled the dola-duka of Ceylon (cf. Obeyesekere), but without the hostilities built in by the Sinhalese.

843 She might also be troubled by the ghost of anyone who had
died violently. This ghost, a *phi tai thang klom*, caused
[775] "the worst of all possible deaths." The *phi krasü*
spirit,[25] entering through her anus, also might cause
death by consuming her faeces, organs or the child's
entrails. It was more dangerous during and after childbirth
than during pregnancy (Textor:304-320). The
[753] supernatural disease missile called "*khun*" might also
strike. "If the mother is under 9 months pregnant, the
baby inside can protect (itself). If this happens during
the ninth month, the doctor uses holy water to extract it
at the time of birth." *Khun* was recognized by "extre pain
[751] occurring just before the baby comes out." To protect
themselves, women wore extra talismans or had 2 dots
[30[illegible]] tattooed under the arm.

843 There was no assumption that what was born was
843 inevitably to be human. When people said of a woman who
845 had died pregnant, "the child ate the mother;" or, at a
miscarriage, "the mother ate her child," or if many of a
couple's children died, "they eat their children," the charge
might be merely the comment of a vituperous neighbor, but the
reality of vicious, autonomous beings, human or otherwise, in
the womb was unmistakable. A certain woman died pregnant.
The fetus, removed surgically, was observed to have 2 visible
teeth, which indicated it was a non-human, *iak* (giant).
However, a child might also be the soul of an angel in the
form of a falling star that entered the womb in the advanced
stages of pregnancy. "If such a baby lives it is pure and is
a very wonderful child." Episodes were described of women
giving birth to "gold," "jewels," "a monkey," "a fish's
stomach," and a mouse-like "Golden Child." Sometimes these

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[771] 25. This spirit ate like a dog, not like a human being, in
eating faeces and putrid meat (McF.46). No revulsion nor
[783] idea of filth and contamination was found in Bang Chan's
attitudes about faeces or urine. The infant in the womb
[514] sat peaceably on the mother's faeces. It was lucky to
dream of faeces. In daily life human and animal excretions,
[262] like sins at the festival of Loy Krataung, were carried
away by the canal waters. Bang Chan Buddhists recognized a
need for cleansing, but not for purification. Since neither
faeces nor sins were filthy the water was not contaminated.
Even putrid meat was not disgusting in the context of the
perishability of the flesh, but as food it was revolting.
Muslims, however, had built in contamination to their concept
of sin, so required purification.

843 farmers brought to the fields an offering of two kinds of
782 bananas (kluai hōm and kluai namwā),sugar cane, taro,
young coconut and cakes; and "fresh earth burned and
776 offered with oranges and other kinds of fruit."[27] She was
also given the things "dear to women": new clothing,
perfume, face-powder, hair lotion and a mirror. In the
843 annual harvest ritual, when some woman (never a man)
776 escorted the Goddess from the field to the rice bin,
participation was forbidden to a pregnant woman because
784 "the Goddess-Mother might be jealous of the woman's heightened
beauty" and so be malevolent. Also, "being now emotionally
weak and easily upset, a woman might be frightened by seeing
the Goddess, who, after all, is close to being a spirit (phī).

843 The prominence of food cravings in this traditional
•262 description leads to a consideration of diet in pregnancy.

Diet in Pregnancy[28]

As long as everything went well, pregnant women "ate as usual." The underlying premise was that each woman early in childhood had established a regular diet suitable to her individual make-up of elements, and eliminated foods that because they did not agree with her or were disliked, were judged "not compatible." A woman could eat as usual because the ordinary daily foods, rice, coconut, etc., were "safe." The modifications introduced to beautify and protect the mother and baby were made on the basis of the properties and

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27. The goddess was following traditional "defeated by one's pregnancy" (phāethōng [Mc.F: 599]) symptoms of desiring "sour, salty, or strange things such as burnt earth." Like any woman, her craving for sweets indicated that a heavenly creature was to be born; for fruits, that she would bring forth an animal; for burnt earth, that the god Brahma would be born (Anuman Rajadhon 1961:115-116).

[114] 28. This section does not purport to present a dietary study in modern nutritional terms. Hauck's study (1959) of maternal and child health gives information on foods eaten, craved, disliked, or viewed as "good for" or "not good for" women during child-bearing, and also on illnesses found among pregnant women, including beri-beri, nausea, cramps, and fainting. The data here add to her information on behavior and stress traditional views as to the purpose of the dietary injunctions.

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qualities of foods. Chili peppers were avoided because they "burned the baby's skin." The cooling klūai namwā banana ensured a [illegible]-tempered child. The fact that one woman ate cobra curry and suffered heat, while another took it comfortably, indicated, however, that what was bad for one might not be bad for another. Individuality of constitutional make-up explains why views varied considerably on proper diet in pregnancy and lactation (cf. Hauck 1959:2,16). Those who were eying urban ways added to the variety by occasionally following modern medical advice. A schoolteacher, for instance, ate eggs regularly and during pregnancy----not the "old way."

Women were urged to eat a great deal for they were eating for 2.[29] Cravings were not compelling, but to increase food intake, preferences were indulged, even when involving out-of-season fruits, expensive, or "dangerous" items (Hauck, 1959:14).[30] "A pregnant woman can eat any kind of food because she is sailing on a tremendous ocean [a traditional phrasing, cf. Anuman Rajadhon:108)] No one can predict whether she will live or die. One wants to eat chicken and kills it herself. Another has dreams and nightmares about craving certain food." She who flouted the Buddhist prohibition on taking life and killed a chicken to eat was not critizised. She was shouldering

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[29] "To increase the appetite" was of frequent concern (cf. Hauck, 1959:27, and Sharp et al., 1953:256-260). Food in quantity and the appetite to consume it was one of the main props of social relationships and of personal security (L.M. Hanks, 1963).

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[30] Some of the likes and dislikes mentioned turned out to be a recitation of the traditional food injunctions set down in the old "textbook," Promcindaa, quoted by Phya Anuman Rajadhon (116). That fresh fish tastes and odors were the most frequent dislikes (Hauck, 1959:14) should be seen alongside the following "symptom of pregnancy sickness: if the mother desires to eat meat and fish and raw things----a creature of hell has come to be born" (ibid:116). Such an idea might well discourage the eating of fresh fish and underlie Yong Chutima's statement that "women were supposed to eat less meat than men" (quoted in Hauck, et al.,1958:42), and found as a prevalent attitude in Cha Chung Sao (H.M.H.). The out-of-season fruits, Chinese noodles (an expensive or party fare) and hot foods (dangerous) fit certain craving-categories of Obeyesekere (pp. 338-339).

843 262 [184] sin for the sake of nourishing the child. Some Thai village women followed a local Chinese belief that eating a female chicken gave strength during pregnancy. Eating a rooster, though, caused miscarriage through "estopic gestation." Thai Muslims recommended chicken whole-heartedly.

Medicines

843 278 Beginning early in pregnancy, one or more kinds of medicine (yā) were taken. These hot-tasting medicines of ginger, galanga, pepper, and such in 28 per cent alcohol were either bought from the big selection at a Chinese drugstore, or were made up at home from alcohol or water and an envelope of ingredients. A woman made the choice herself with the advice of experienced persons. Even the Muslims who ordinarily frowned on alcohol permitted their women to take it at this time. A few women, though, said they "did not like to get drunk," so took their medicines in hot water. The quantity varied from two to six spoonfuls per day, with big increases as delivery approached, e.g. "two big cups a day of it during the ninth month."

The primary purpose of medicine was to increase the appetite, but there were other reasons. Fragrant Medicine (yā hauaum) cured wind. One Muslim midwife's mixture "stimulated the amniotic fluid." Other preparations had more general objectives. One label advertised "strength and good blood to men and beauty to women;" another promised to "maintain the mother's body and make the inner organs do their work properly" (M.M.H.).

In the last months, the reason for the medicines was to build up the body's heat. This purpose was not affected by hot tastes, which burned but did not necessarily raise the heat, but rather by alcohol, cobra, and specific decoctions. A label cautioned, though, "Not to be used by pregnant women with fever," lest the increment of heat be excessive. Snake Brand medicine, an exceedingly hot concoction used primarily post-partum, was occasionally taken in mild dosage during pregnancy. (Used full strength it caused miscarriage, so was rumored to induce abortion). The heat raised the body's temperature far above the ordinarily desired coolness so as to implement birth.

The Physiology of Birth

844 826 At parturition the body's usual needs were reversed. The child could not be ejected under the normal, cool condition of the body. The pushing and pulling winds inside the body that ordinarily circulated slowly had to be

speeded up with heat to the point of blasts. The strength of 844
the contractions of labor was in direct proportion to the speed 826
of the winds' circulation. The great pushes of the expulsive lom beng "broke down" the sac with the amniotic fluid (nam thūn hua: water-that-supports-the-head-of-the-child), and forced out the child, water, and the placenta.

After the child was out, the mother was cold, weak, and exhausted. Her uterus was full of harmful fluids. Heat was needed more than ever not only to warm her but to give the winds "the power and push" to drive out three undesirable birth-waters: "The blood that looks like ordinary blood but is bad,"; the amniotic and abdominal body water (nām khram: refuse water); and the pale, viscous, repugnant "fish-water" (nam khāo plā). Therefore, a hot fire was built, close to which the mother lay (yu fai), turning all sides of her body towards 844
the flame. She bathed in or drank hot or warm boiled water [372]
(nam suk: cooked, or ripe, water). She ate safe foods like rice and dried fish,[31] and kluāi nam bananas, continued to take [262]
alcoholic medicines of the hottest sort, such as Snake Brand, and occasionally might be given cobra or other hot curries to eat. For a first-born, a woman stayed eleven or nine days by 846
the fire (always an odd number), with stays shorter for each successive child, but never less than five days.

Complications sometimes developed because of inadequate 846
control of the heat. A "headache and a hot body" indicating 758
"stagnation of the blood and the fishy-smelling-water," was 278
cured by a heat-producing decoction. Rashes often occurred, causing small boils that might develop into sores. To soothe 826
these, turmeric was painted on. In the most dangerous cases the heat "drove the bad blood to the heart, to the face or [164]
belly" where it was recognized by serious swelling, with resulting madness or death. In fact, one mō felt that the

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31. The reasons for rejecting fresh fish during pregnancy 262
("lest a creature of hell be born") would not hold after parturition. Yet fresh fish was rejected then too "as bad 843
for the womb." One suspects that the less odorous dried fish was substituted so that the odor of fresh fish, like 846
air-borne, incompatible food, would not affect adversely the "fish-smelling" post-partum discharge (nam khāo plā). In Hauck's list of foods "bad for mother during the post-partum rest," the reasons are apparent: Sour tastes did not dry out the body, but built up water; egg was too cooling; jackfruit brought in wind; glutinous rice and the sugar of sweets "wet the uterus;" fruits did not give strength and were excessively cooling (cf. Hauck,1959:18).

843 many kinds she hardly knew which to choose. He also had all-
278 purpose kits for mother and baby, even one with 14 different
kinds of medicine "to control the body's temperature and
keep the organs functioning"(H.M.H.). She decided on one
of the favorites, pickled medicine (*jaa dauaung*), and from
843 then on took a spoonful twice a day. She avoided all peppery-
hot foods which would "damage the delicate complexion of the
262 infant in the womb, burn off its hair, and maybe even kill
it." Some women said they craved sweet, hot, or sour foods,
but Dūan did not. A friend who had never eaten cobra curry
so longed for its hot taste during her pregnancy that her
mother gave her a small dish. She could not resist secretly
finishing the whole pot! What heat and sleeplessness! To
cool herself, she had sat in the canal. The baby, saved only
because its mother drank the water from a young coconut
fruit, "could resist the cobra heat because it was 6 months
along, but even so, it shed its skin at birth." But another
woman, pregnant 7 months with her third child, also craved
cobra curry, ate a lot, and said she did not feel hot. Nothing
at all happened! The second woman was nearer to delivery,
so stood the heat better, but more important, each individual
was different. Because of virtue and sin in former lives
each woman--and man, too--was born under different astral
confluences and had lived and suffered differently.

843 About the seventh month, Dūan pondered who should help
her at her delivery. Some of her friends were delivered by
759 their own mothers, but Lok had undertaken the delivery of
another daughter's child, and the baby had died in an hour.
Dūan suspected that her mother, therefore, would prefer not
to do it, and knew that she herself would feel uneasy. So
she decided for safety's sake to ask a midwife. She and
Song could well afford the ceremonial offering with its
customary 20 or so *baht*, even though the midwife said it was
"as you please." A great many women never consulted with a
midwife beforehand at all, but just sent word to the nearest
one when the pains started or when trouble was encountered.
Midwives varied in their capabilities, however, and Dūan
wanted not only a good one but someone she knew well. Muslim
midwives were said to be skilled, but they happened to live
too far from her. Dūan decided to ask her elder aunt, Sāi,
who was a well known midwife. Everything was right about
Sāi She had experienced hands, a true desire to help, and
effective magic; and she was a relative. Best of all, her
own babies had eaten and slept well, had cried little, and
now were grown to maturity. With such proof of merit,
capabilities, and fortunate relations with supernatural
powers, what better person to help Dūan start her baby on
its earthly existence? Actually, if something happened,
and Sāi could not come, Dūan knew she would not be alone or
unassisted. Almost every woman, and quite a few men, had

846 789 782 Now that the fire was going nicely and Dūan was "ready to warm her body," the all-important prayer and incantation "to control the hotness and poison" of the fire had to be pronounced lest the mother's body be "swollen or burned." Sāi took raw rice, salt, and alcoholic liquor[36] in her mouth, chewed them, and sprayed them over the fire and over Dūan's body three times, saying "Spirit of the Fire and Wind, may both mother and baby be cool and happy!" and murmuring her secret formula with ancient Pali words about "great fire" and "death."[37] With the shoulder cloth (*sabaichīang*) that she always wore to the temple draped diagonally over her left shoulder and under her right arm, Dūan knelt and faced the fire. Praying for happiness to the Mothers of the Fire, Fire-floor, and Wind, and finally to the Lord Buddha, the Holy Brotherhood of Priests, and the Sacred Law, she bowed, hands clasped, and touched the floor three times with her forehead. Then she rose and lay down on the plank with the holy fire on her right side.

846 [757] [853] As Dūan was resting quietly, Sāi made three "taping fruits" (*lūk prakhop*), balls of tamarind leaves, *phlai*, and salt wrapped in cloth. One was put well up between Dūan's legs to cure the birth wound (*phlāe*). The other two were set aside for use on subsequent days. Sāi painted the baby's tongue with alcoholic medicine, and from her fingers dropped a little honey and boiled water into his mouth. Then she laid him on his tray on the floor close by Dūan, on the side away from the fire.

787 827 With satisfaction of a job well done, Sāi and Lek sat together for a quiet chew of betel. "Lek," said Sāi, "has it occurred to you on what a good day this boy has been born? It is a Saturday, so he will have power. Nothing, nobody, can hurt him! Once I delivered a boy on that best

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[273] [262] [36] Alcohol was heating; rice, strengthening. Salt appears to be drying.

[263] [776] [37] The deities addressed were *mǣ phra phlōeng* and *mǣ phra phāi*. Another Pali-Thai magic formula to control fire was: "*Phra Mōk Khan Lā Nō* will extinguish the fire from hell, *na mō phut tha ya*." Phra Mogdallana, one of the two most faithful disciples of Buddha, caused the fires of hell to go out (cf. Anuman Rajadhon 1961:137). The *na mō*...etc. was a traditional phrase to prevent spiritual dangers and is a repetition of the names of the Buddha in five incarnations, past and future (cf. Textor 1960:483-485).

854 mosquitos, but then Song bought in Mīnburī a bamboo frame
with be-flowered netting. He also bought little mits to tie
onto the baby's hands, so the fingers would not be sucked.
Not every baby got these! Most of the time the baby lay
naked, but was wrapped when nursed. One cool day they put
over him a thick blanket. Lek, Dūan, or Song bathed him
in boiled water 3 times a day and always after his excretions,
which were wiped off with cloths. Then fresh cloth
was put under him. On the seventh day since he was thriving
[856] he was bathed in ordinary rain water. Every day Lek vigorously
squeezed his fingers and legs "to make them straight,"
which made him yell each time. To speed the drying of the
[278] cord, a charred leaf of betel pepper was applied for a
while to his navel on which Dūan spit saliva several times
a day.

853 Dūan's milk supply was only fair. For milk stimulation
they pressed her nipples and kept the fire hot. She was
also taking daily a special nursing curry of banana flower
[262] and vegetables (khaēng līang). One day she ate a cobra
curry. A neighbor offered to help nurse the baby but Duan
refused. "It is a pitiful sight to see one's child at
[854] another's breast." Whenever the baby wailed he was given
boiled water but was not necessarily at once picked up. If
his crying continued, however, Dūan washed her breasts with
warm water, pressed out and threw away a little milk,
moistened the baby's lips with water, then lifted him on
the pillow to her plank. She laid him beside her and
leaned over him to nurse, though occasionally took him in
her arms. He was nursed about 10 times a day, and also
received honey, boiled water, and a bit of banana, too.
[278] One day the baby cried a lot, so they painted him with
turmeric and gave him baked cobra tail in alcohol to warm
him up.

846 As to her own diet, Dūan followed the usual practice
262 of limiting herself rigidly to rice with salt, dried fish,
and baked kluāi namwā banana. Egg was too cooling:
"like glutinous rice, it brought pus to the unhealed cord
and the vaginal wound." Dūan also avoided "jam" bean
which caused madness, fruit, and sweets. Whatever she ate
affected her child by secreting into her milk. If she
were sick, he would be so too. If he alone became ill,
she must watch the foods both he and she ate. All these
food instructions would stop only when nursing stopped a
year or two later.

846 Duan decided to stay only 11 days by the fire,
though Sāi had said 13 and she would have liked to stay
longer. However, she wanted to get back to work because
the transplanting season was approaching. Besides, the

846 [787] Seven days after the end of the fire period, Dūan sent a message to the mō to look in his book as to what direction from the house she should bury the phlai, the bamboo knife, and the pot with the now dried placenta and cord. She already knew some of the procedure: burying should take place on a Monday or a Friday; south was right during the first three months of the lunar calendar, November, December, January; and the full moon of the twelfth month (October) was especially good, for the moon waned thereafter. Chāi had been born in October, so north was right for him, but for a girl it would have been east. Song or Lek or anyone could bury the pot, but most mothers did it themselves. If it were buried in the wrong direction, the baby would die, and if not under a tree, he would leave them and their home, and roam. The instructions came. With the things in her hand, she walked toward a big jackfruit tree. Beside it was a sakāe. Either was good, so she chose the sakāe which, being nearer the house, might strengthen by that much the roots that would keep her boy at home. After burying the pot and all, she returned directly to the house, remembering to pick, as she came, a fruit, a vegetable, a leaf, and then a piece of wood, all useful things. In the house she added them to the usual household stores. By doing so, and by using them up shortly, she ensured that her new son would be a good worker, who on returning home would always bring something to add to the requirements and wealth of the household. Once buried, the placenta, "like ashes," was ignored and the spot forgotten.

846 262 [461] [753] [757] 862 Within a month after childbirth, Dūan was back at farm work, even to the back-straining pounding of rice in the big mortar. For three months she avoided fruits, particularly guava and jackfruit. Then, since the baby was thin, she gave up vegetables, especially gourds, corn, and the green plants that grew in the canal. One day, because she carelessly ate some salted field crabs, the baby got thrush on its tongue. They cured him by smearing the milky juice of a peel of klūai nam banana on the cloth sheet covering his cushion, then wiping this on his tongue (cf. Anuman Rajadhon 1961:153). So the year passed, and then another. Not long after his third birthday, Dūan realized she was pregnant again, so took steps to wean him. She painted her nipples with "black medicine" (yā dam), a bitter and hot tasting ointment made from the boraphed rhizome (McF; 474). Then she sent the child over to her mother's older sister's house for four nights. To make quite sure, she followed an old ritual way, too. She boiled an egg hard and peeled it. Holding the egg behind her back, she turned her face away from her son, and handed it to him behind her so that she could not see his face. "Henceforth, you shall not nurse any more," she said. Without looking at him, she walked

153 853 of making poor milk. Any woman whose milk flowed early and well needed no example, for she was seen as having the habit as an in-born characteristic so deeply ingrained that it came through from a previous incarnation.[43] After nursing was established by the mother, babies were not often given over to another woman's breast because they were reputed to refuse it, "being not used to it."

In sum, the nursing patterns in Bang Chan varied with the previous lactating experience (if any) of the mother, and the ordinal position of her children.

[262] [846] Hauck shows the old way of establishing good eating habits in a baby. "If a mother ate small amounts of many different kinds of foods while lying by the fire, the child would not get diarrhea when he ate these foods for the first time" (1959:14). Through the beneficial effects of the fire, any deleterious qualities of the foods were eliminated (as we shall see in "The Fire of Maturity") and the child had his first experience with these foods in the breast milk.

153 Bang Chan's life was full of secondary opportunities for starting new habits. Every rice crop, every boat purchased, every house built, and all the rites of the life cycle could, if handled properly, start a fresh and fortunate sequence on its way. We shall have more to say of this in discussing maturity.

789 844 Imitation

The familiar principle of imitation (Anuman Rajadhon: 154), the influence of like making for like, operated throughout daily life in Bang Chan. An action, event or presence emanated an analogous influence on its surroundings. A woman returned from a visit to the midwife with all possible speed in order to achieve a speedy delivery of her child a few weeks hence. Another pregnant woman visited the temple on the final day of the rainy-season Buddhist

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[829] [43] Bradley's informants gave an example of a deeply ingrained habit: "European and American mothers can better dispense [with the fire-rest] because their own mothers from time immemorial have never been in the practice of the custom, and consequently their constitutions do not at all require it (p.79)."

846 262 In addition, strengthening foods like rice and fish, the staples for stout farmers, were stressed. Fruit, "which gave no strength," and vegetables (except for the nursing curry mentioned below) were avoided.

846 372 827 262 The holy fire also transformed a woman into a better nourisher. It gave her new, lasting beneficial nursing habits. As one man explained, "the very nature of water is changed by boiling over a fire. It becomes *suk* (ripe)." Similarly, a woman's body, her very nature, was permanently changed to *suk* by the fire's heating. The fire, in fact, made *suk* all the food she ate beside it. Since this food was turned into milk, her breast milk became *suk* and so more nourishing, and did not disturb elements.[52] "Food eaten while lying by the fire, when eaten later on (during lactation) by the mother, does not cause diarrhea in the baby." Jackfruit ordinarily caused wind-trouble during lactation, but one woman ate it during the fire-rest, and at once "got used to it, so she could eat it all the time." To make themselves better nourishers, some women spoke of the desirability of "eating a bit of every kind of food." The "nursing curry" (*kaeng liang*) was a mixture of vegetables.

846 372 774 [776] Finally, the consecrated fire strengthened a woman's own *khwan*. She could better withstand convulsion if attacked by a spirit.[53] She was able thereby to handle a *khwan* even without the special magic that existed for it.

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[252] [52] To be nourishing even the daily rice had to be made *suk* by boiling (Anuman Rajadhon:77). It may be that no food was considered nourishing unless *suk*, either naturally (like ripe fruit) or by cooking.

[787] [53] "...when 'involuntarily' entered by ghosts...maidens in the 17-25 age bracket tend to convulse more violently than do women of more advanced years"(Textor:406). "Maidens" were presumably not married and so not *suk*.

562
156 (riak khwan). Theirs was an augmented personal potency[55] in
nurture not unlike the mana so widespread in the Asian-Pacific
area.[56] The best midwives were līang dī, though not all līang
[059] dī were midwives. This societal peak was not an unattainable
ideal. In the community, certain women were pointed out as
līang dī and some of them recognized in themselves the vali-
dity of this title.

562 The association of rice, motherhood, and khwan now stands
clear. Rice made suk by cooking over a fire, was the essential
774 food not only for the body but for the khwan. Growth and life
depended on the nourished khwan. Rice came from a maternal
776 figure, the Rice Goddess, Mae Phōsop (cf. J.R. Hanks, 1960).
Human mothers, too, when made suk, gave suk nourishment: the
262 milk of the breast was merely transformed rice. Whenever rice
was eaten throughout human adulthood, the Rice Mother continued
her nourishment, for in each grain was a bit of her khwan,
nourishing to the human khwan. The rice-bowl and ladle, used
in many a ceremony, stood for the maternal care given a human
khwan, and by extension, personal care throughout life. When-
[782] ever the rice bowl with offerings (khwan khao: soul-[of]-rice)
was presented by a parturient or by a sick person, loving care
comparable to maternal care was being requested.

182 The idea of re-birth, of a fresh start within the pure
area encircled by the holy cord, with auspicious words and
885 consecrated fire, was deep in every life-cycle rite. The
particular circumstance of the fire of parturition was a
846 forthright cooking to bring out and increase a woman's
562 essential femaleness, to transform her from a youthful,
partial giver into a complete, mature donor of nourishment.
372 Such was the satisfaction of women in this female role that
many said they would like to be reborn as women. Few wanted

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[55] Anuman Rajadhon (p. 134) reports that in India a newborn girl needed no ritual paraphernalia to keep away spirits because "her sex...is a protection in itself, and spirits cannot come to bother her." This was close to Bang Chan's idea of female potency.

[56] Cf. "Mana" (E.R.E. VIII:375) for a quick run-down on a definition of mana.

844 this rust is believed to cause tetanus--and they are unsuita-
178 ble for the ritual objective at the moment of cutting. It
will be remembered that cutting the cord on a rhizome of
177 phlai or soil with a bamboo sliver from the housepost guar-
antees that a child will not roam away from home. Could the
412 bamboo sliver be dipped in "heating" alcohol, or passed over
the flame of a holy fire? Could the old family kitchen-
knife--long associated with the household--be substituted
and dipped in the beneficial heat of boiling water? Such a
knife once was substituted on the winnowing tray. Might the
phlai or soil be covered with a boiled, clean, old cloth?
If modern science succeeds in coming up with an acceptable
substitute, one sees the possibility of a very small change
making a big difference in the amount of tetanus poisoning
observed (Hauck, 1956:41). One should then ask the midwives
to watch as to whether the new method reduced the infection
called "death because of a red or green face and clenched
fists."

In diet "the concept that a good choice of food is
262 important to the health of both mother and child" (Hauck,
1959:2) was very much shared by modern science and by tradi-
tional ideas but the basis of choice was entirely differ-
ent.[77] Modern science has ascertained that certain foods are
[261] beneficial because of certain nutrients, while old beliefs
have set up certain foods as desirable because of proper-
ties of heating, cooling, compatibilities with the elements,
etc. The nature of these properties should be collected and
listed. If dietary deficiencies in Bang Chan are noted, the
foods that combine the needed beneficial qualities in both
systems should be stressed. A hot-tasting tonic (yā) with
appropriate dietary supplements, to be taken daily during
pregnancy, and another kind during the post-partum period,
372 might be acceptable. The period of the fire-rest is the best
place to initiate dietary changes for whatever is done by
846 the fire becomes a habit beneficial to mother and child. The
use of boiled water should be encouraged as "making for
strength." Once again, disturbance of customs is minimized,
and the presence or absence of "increased strength" and
healthiness can be observed experientially.

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[77] Hauck felt the concept was lacking, but it appears only that the grounds of choice were different.

APPENDIX

MUSLIM CUSTOMS IN BANG CHAM

The small Muslim minority in Bang Chan though maintaining 795 [361]
its identity, lived scattered through every hamlet, with the [582]
heaviest concentration around the mosque at the southern edge
of the village. The occasional inter-marriage of Buddhist and
Muslim was eventually amicably adjusted to the community and
the religion. Some Buddhists manifested a veiled hostility in 795
calling the Muslims "stingy." One said, "Muslims have expen- 829
sive medicine to induce abortion, after which they might kill
the baby. A Buddhist would use this medicine to help deliver, 847
but would not dare take life." The Muslim reputation as a
source for powerful magic, especially for love and sorcery, 578
bespeaks some edginess in the relations between the 2 ethnic
groups, but Buddhists sometimes sought out the benefit of this
magic.

In spite of these separatist tendencies, the Muslims were 571
fully Thai citizens, and participated as equals with the 795
Buddhists in the economic, political and much of the social
life. The 2 groups were in many respects interdependent. The [641]
Muslims did not object to taking life, so acted as butchers
for the Buddhists. Muslims were frequent patients of Buddhist [463]
mō, whether priests or lay. The only Muslim who did a little [756]
curing was the To Iman, head of the mosque, but few if any
Buddhists came to him for cures. Because every *mō* gave an
annual ceremony of homage to his teacher attended by everyone
who had benefited from those powers during the year, Muslims [796]
and Buddhists met amiably at several large feasts. These
festivals were public displays, very competitive in feeling, of
the success of the different *mō*. One became the largest of the
village-wide festivities. Buddhist women attended the Muslim
female midwife, teacher-rites, and vice versa. Buddhists and
Muslims, especially the prominent families, attended each
other's home ceremonies, such as weddings, tonsures, and that
part of the ordination held in the home (the *tham khwan*).
Separate kitchens were established at large Buddhist ceremonies [262]
so that Muslims could safely adhere to their one dietary regula-
tion, the avoidance of pork. No such arrangements had to be
made at Muslim ceremonies for Buddhists had no food taboos, and
loved Muslim cooking.

Midwifery was an area of frank, harmonious interchange, 759
with midwives of either religion often attending women of the 795
other. Buddhist male midwives were allowed by the Muslim hus- 844
bands to attend their wives, though female attendance was
preferred. Satisfaction was expressed by Buddhist women over 571

SUMMARY

105 26 [220] A general description is given of conditions in a Siamese rice village, 1952-54, as they relate to food supply and food habits. Activities at various seasons of the year are described. The heavy work seasons occurred during transplanting and harvest. In the dry season, many ceremonials and festivals were held in which food played an important role. Such occasions provided opportunity to "make merit" and add to one's prestige as did the regular offering of food to the priests, throughout the year. The relatively large financial obligations undertaken by those sponsoring ceremonies was a major factor in the economy of the village.

105 262 433 [236] [433] [244] [245] [222] Food was mostly home produced and an important factor in the standard of living was the number of productive hands available. Rice was the first essential for any meal. Home milled rice was used, even in part, only by a minority of households. Fish, fresh or preserved, was the food next in importance to rice. Use of flesh foods other than fish was probably inhibited by Buddhist tenets which prohibit the taking of life, but some poultry, oxen, and other flesh foods were used. Nearly all of the families in Bang Chan raised chickens, and some raised ducks, but about 3/5 of all eggs produced were sold. Every family had some sort of kitchen garden, including banana trees and other plants, but spices and chili were much more commonly grown than vegetables and fruit. Swamp cabbage, the green leafy vegetable used most often, grew wild in the canals. A calendar of fresh foods commonly used in Bang Chan is presented.

[443] Cash expenditures for food were small. When canals were navigable, boat venders brought produce and during the busy work seasons farmers often bought fish as well as the usual foods: onions, garlic, limes, coconut, palm sugar and small amounts of vegetables.

[434] [178] Many households increased their income by the sale of eggs, vegetables gathered from the canal and other items. Culture of tilapia and mushrooms, begun during the period of study, was undertaken by a considerable number of farmers between 1953 and 1955. Both enterprises were apparently regarded primarily as a supplementary source of cash rather than as a means of improving the home food supply, and both efforts had been largely if not entirely abandoned by 1957.

105 264 Preparation of some typical dishes, meal service and techniques of eating are described. For adults, two meals a day were usual, except during the busy work seasons when a third meal might be eaten. Menus were similar for all. Two observations from records of school children were 1) that over 90% of them ate snacks, many of which were bought from venders on the school grounds. Sweets and fruit were the

Sweets and fruit were the
105 items most commonly eaten. Fruits were seldom eaten except as
262 snacks.

271 The customary beverage with meals was untreated water.
105 Rain water was preferred for drinking, but for 3 or 4 months
of the year, water from the canal or fish pond was used.

105 Attitudes toward food, and foods considered appropriate
262 for the very young, the old, for the pregnant or nursing woman
and for use during illness, are briefly discussed.

105 Quantitative food intake for 11 families was recorded
126 on a total of 44 survey days distributed throughout the year.
146 Two groups of families, in which individuals were matched so
far as possible as to age and sex, were selected on the basis
of apparent difference in nutriture. The sample was not stratified with respect to economic conditions, but those in Group B, chosen for apparently better nutriture proved to be, in general, more prosperous than those in Group A, chosen because of signs of poor nutrition.

105 Food values were calculated on the basis of published
146 analyses. Conservative nutrient allowances were estimated for
residents of Bang Chan. On the average, calories, protein, iron, niacin and ascorbic acid in the diets of persons in Group B approximated or exceeded these allowances. For Group A, this was true for niacin and ascorbic acid only. Average intakes of riboflavin were estimated to be about 1/3 or less of the allowances, and estimates of calcium intake were about 20% of the allowance for Group A and 30% of that for Group B. Vitamin A values of diets for both groups appeared to be low, and thiamine intakes marginal or low. The signs observed among persons in these families were generally those associated with low intakes of thiamine, riboflavin and vitamin A.

Rice contributed about 4/5 of the calories and over half the protein in diets of both groups. Animal foods, chiefly fish, furnished about 2/5 of the protein. Intake of fats and sugar was small. Snacks of fruit contributed about 1/6 of the total ascorbic acid for Group A, and about 1/9 for Group B.

Seasonal variations in food preparation, meal patterns, food costs and caloric and nutrient values of foods eaten are discussed. Higher caloric intake during heavy work seasons was largely accounted for by larger amounts of rice eaten. The highest intake of protein for both groups occurred in the post-harvest season, when fish ponds were drained.

Questions for further study are proposed, and possible approaches to improving food habits and nutritional status in Bang Chan are suggested.

426 Because of scattered farms and frequent shortage of cash, borrowing food and other items, and many exchanges of service were necessary. Blood-kin were easier to approach, and in the larger social unit, nearer. Borrowing from a non-kin neighbor was supposed to be less frequent, and the favor had to be returned more promptly and exactly.

434 Most opportunities for increasing cash income such as hiring out as temporary farm labor, digging canals, marketing eggs, mushrooms, or cooked snacks, took one out of the home, often overnight. In the small family, one partner was left at home. Both could not go because fear of theft forbade leaving a home unoccupied for any length of time.

The Buddhist Priesthood

792 At the temple lived twenty or thirty priests under the abbot, with a group of boys to serve them. The priesthood was maintained by daily voluntary offerings of food, with larger donations of food and commodities at certain times. Persons who thus "made merit," by supporting the priesthood, by giving to the needy, and adhering to the ethical tenets of the Buddhist religion, reaped a reward of health, happiness, wealth and eventually, freedom from rebirth. The immediacy of these beliefs must not be underestimated. Men only were ordained. They might resign at any time after three months, but some spent their lives in the priesthood.

792
262
431 In Bang Chan, throughout the year, the priests set out at dawn to receive cooked food for the day. They appeared at houses by more or less specific arrangement and were given a generous share of the food prepared by the family for its own use, sometimes with the addition of fruit and other delicacies. Each priest stopped at two or more houses. The food then was brought to the temple to be eaten at 8 and 11. For the rest of the day the priests fasted, i.e. they ate no solid food, but drank liquids such as tea, soft drinks, and recently, tinned milk and a fortified malted milk drink. Priests were also invited to eat in homes not only at large ceremonies, but at small merit-making occasions. Sporadic special food offerings were also received. If a buffalo died, much of the meat was usually given to the temple. Traditional practitioners, mid-wives, and ceremonialists always gave the priests a portion of the fees from their practice which consisted in 1 or 2 liters of milled rice, a bunch of bananas, and perhaps cash. On the numerous Buddhist holidays and at specially organized temple convocations, quantities of cooked, preserved and raw foods were brought to the temple and apportioned among the priests. From this bounty a meal was served to the priests, who ate while the villagers looked on in satisfaction.

One of the duties of the abbot was to coordinate the

792 village offers of regular service, the holiday offerings, home
262 invitations and sporadic gifts so that all priests had places
431 to go, no one had much more than any other, and that the whole temple did not undergo periods of undue glut[1] or hardship.

792 About mid-July, Buddhist Lent changed the food habits
794 somewhat. This three-month period corresponded with the height
262 of the rainy season. Priests did not leave the temple to gather offerings on rainy mornings, but younger priests, assisted by the temple boys, cooked meals from supplies on hand. On the first day of Lent, people brought less perishable foods: green bananas, coconuts, sugar cane, pomelo, sweet potatoes, taro, onions, garlic, salt, sugar, dry salted beef paste, dried fish, canned goods, and milled rice. During Lent fresh or cooked foods were brought in, and some ladies volunteered to cook for varying periods of time. On a holiday in September, families made up such quantities of a sweet of "puffed" glutinous rice, sesame seed, and peanuts pounded and held together with sirup and sometimes covered with grated coconut that priests were tired of it and many children got diarrhea from overeating of it.

In mid-October, the Lenten restrictions ended with another holiday offering, and thereafter the priests went regularly on their appointed rounds.

796 On Buddhist holidays, the people did not usually eat any
261 of the food brought to the temple, but on (3)thauaud (2)ka-(5)thin[2], an all-day festival held in October or November, after feeding the priests, the people also ate bounteously.

792 Residing at Wat Bang Chan in 1954 were 22 boys, aged 10
857 to 16, sent to serve the priests, get their living and attend
262 school. Most of them were from poor or disorganized homes. They shared the food offerings from which they received three meals a day. Among the children's food records, the food listed by these boys as eaten the day before was comparatively diverse.

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792 [1] Amounts of food given usually exceeded the actual
262 needs of the priests and temple boys. One instance was noted
737 in which food was sent by the priests to a needy old person
235 nearby. Leftover rice was dried and sold for chicken feed.

114 [2] The transcription used throughout this report is
104 that described by Sharp et al., 1953, pp. 12-15. Numbers in parentheses represent the different tones of the syllables.

Seasonal Activities

128 A chart has been prepared to show the climatic conditions in Bang Chan and what people were doing at different seasons (Chart 1). For convenience, the periods covered by the four rounds of the dietary survey (p. 58) are included.

221 The year starts with May, the beginning of the rice-
132 year. At this time the rains began to soften the parched
ground, and the heat slackened. School re-opened. Farmers
241 turned to plowing, harrowing, raising the seedlings. Both
512 sexes worked about equally in field labor, boys from 14 and
[871] girls from about 15 years of age performing tasks according
[562] to skill and strength. Everyone was in the field at dawn.
[883] The buffalo, but not the farmer, rested through the noonday
heat (about 10 a.m. until 2 p.m.) and also on the weekly holy
day. Meals were usually eaten about 10 a.m. and after re-
264 turning from the field at dark. Although two meals a day
were usual at other times, at this season, some had a third
meal about 2 p.m. If the buffalo were brought home to rest,
[262] this meal could be eaten at home, but hired laborers or those
working far from home often took with them rice and other
foods in a (2)pin-(1)too, or tiered lunch kit.

221 With the rains, the canals had filled, so that by June
132 buyers with big rice boats could return. The few farmers who
[501] could afford to hold onto a portion of their last year's crop
[441] sold it for a better price at this time. Vegetables and
[241] fruits which had died in the long drought were replaced, and
trees were planted.

In July the heavy transplanting season began. Because
241 of cooperative work habits or hiring out, people worked
221 solidly day after day for two months on their own or on an-
132 other's fields. It was dawn-to-dark, back-breaking work.

This was an anxious time. The seedlings had to go in
at exactly the right time. Water level was only partly con-
[312] trollable. Lack of rain might be remedied by pumping water
from the canals but flooding would drown the plants. School
[871] vacation was scheduled at this time so both teachers and
[857] children could help. Older children might work in the fields,
[887] while younger ones, from 8 to 13, and the aged took over the
care of babies and toddlers, fished, cooked, gathered food
[433] for the family and grass for the buffalo. People knew the
crop was subject to drought and flood, pests of rats and
worms, destruction by birds or wandering buffalo or duck, and
in the end to the mysterious fluctuations of the price of
rice on the world market. Moreover, some persons worried
about debts, acquired from giving a ceremony or making a
capital investment and sometimes from heavy gambling during
the rest season.

Chart 1. SEASONAL CYCLE - BANG CHAN, THAILAND, 1953-54

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Season	-> <-----------WET------------>							<-----COOL------>			<---HOT----	
Temperature (°C)[1]	30	29	28	29	29	28	26	25	25	28	30	30
Humidity, rel., %	77	80	81	81	80	78	74	70	70	65	66	67
Rainfall	---> heavy		moderate	<---heavy--->		<------light----->		<-------negligible--------				
Canals		rising			high	(floods)			lowering fast			low,dry
Cultivation of Rice	plowing-------> seedbed grown		TRANSPLANTING			growing	early var. mature <---------HARVEST-------->					
School			vacation					vacation			vacation	
Cash available	cash in hand--------------					<-----cash shortage------>				cash in hand--		
Source		rice			cash jobs--------->				main rice sale			
Fruit;vegetables	-->	<-new planting->							<-----annuals die-----			
Fish: Supplies	ponds drained->							<-----ponds drained-------				
Maturation			<-------many varieties----------->						<---best varieties--->			
Preserving	<----much---->		<---------------moderate---------------->						<----------most------->			
Ceremonies	ceremonies------->		<-----Buddhist Lent----->							<--ceremonies---		
Dietary survey	-->	<-----Round I------>		<--------Round II------->				<----Round III---->			<--Round IV-	

1. Mean temperatures and relative humidity estimated from charts for Bangkok and the central plain of Thailand (Bunnag and Dhararak, 1947). Mean monthly temperature range from 25-30°C corresponds to 77-86°F; diurnal variations are greater, averaging 18°F (10°C) in April and 22°F (12°C) in January.

GENERAL DESCRIPTION OF FAMILY FARE IN BANG CHAN

261 As we turn to a detailed description of the family fare,
701 we should like to point out that starvation was unknown in
Bang Chan. Although much room remains for improvement in
731 diet, "hollow hunger" was uncommon. In the few times when
disastrous flood destroyed the year's crop, the government
was able to provide enough rice so that it need not be ra-
133 tioned. People still ate their fill. Even floods had their
226 advantage: one could fish out the window. That gross caloric
undernutrition was rare was borne out by examination of the
146 school children (Hauck, 1956). "On the average . . . Bang
145 Chan children could not be considered as markedly under-
weight. Few were so thin that one could 'count their ribs'
and still fewer would be considered plump by American
141 standards." In a random sample of village households that
included about 10% of the population, the heaviest man
weighed 69 kg. (151.8 pounds) and the heaviest woman 70 kg.
(154 pounds). We noted no more than half a dozen adults who
appeared to be "overweight." Most were middle aged or older,
and none of them did strenuous field work.

Sources of Food

Home Production, Storage and Preservation

262 Rice. - Rice is an essential part of any Thai meal.
The majority of the rice farmers in Bang Chan had rice for
256 home consumption milled for them at Minburi. In general,
[251] they took their own paddy to the mill, and brought the re-
sulting milled rice home, where it was stored in a box or
mat-bin. Although, according to a recent survey (Goldsen and
Ralis, 1957) nearly a third of the households owned a home
rice mill, undermilled or home-pounded rice was not widely
[26] used in Bang Chan. Information on this point was obtained
for 333 of 336 "kitchen-unit"[1] households in the village. Of
these 5 consumed home-milled rice only, 51 used home-milled
rice in major part, 78 in minor part, and 199 not at all.

221 In households where home-milled rice was used, during
256 June enough would be pounded to last until harvest, at which
time hands were sore and bleeding from the field work and
505 home pounding was impossible. At the time when data for the
256 present report were being gathered, most families took paddy
to the mill when water in the canal was high enough so that
it could be transported by boat. If a farmer on a subsidiary

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[292] [1] In some large houses, two related family groups
lived together but maintained separate kitchens.

256 canal misjudged his needs for milled rice and ran out, he had
505 to mill his own paddy. Since the main canal was deepened in
1953, year-round transportation of rice by boat has been possible for many more farmers, and this may further decrease the consumption of home-milled rice.

256 Of 105 households which had and used a home rice mill,
231 99 used the polishings for feed but no family in Bang Chan
[262] used them for human food (Goldsen and Ralis, 1957). One farmer, headman of a hamlet, who lived near the main canal and
235 the road to Minburi but who used home-milled rice, offered as
256 the reason that the polishings were good chicken feed, and if he took rice to Minburi to be milled, the miller would keep the polishings.

114 As reported by Janlekha (1955) consumption of milled
146 rice in 106 households amounted to about 285 kilograms per
262 capita per year or 780 grams per person per day. Such "house-
433 hold consumption" includes "losses to pests and poultry, daily gifts to priests, contributions to temples and outlays for feasts and rites in undetermined but considerable amounts" (Sharp et al., 1953, pp. 265-266).

262 Flesh Foods Other than Fish. - The people of Bang Chan
231 had a taste and appreciation for flesh food, but the production
784 and use of meat was certainly inhibited by Buddhist tenets which prohibited the taking of life.[1] Killing of poultry, fish, etc. was tolerated among the relatively young, but was considered unsuitable to the aged who should be preoccupied
[792] with living virtuously. People felt, however, that the sin of taking life was condoned if they offered part of an animal to the priests.

Since many villagers were unwilling to slaughter buffaloes even when they become aged and useless, such animals were commonly kept until they died. Animals which had died of old age or disease were not, however, regarded by Thai Buddhists in Bang Chan as unfit for human consumption. Usually they
[792] were cut up and given to the priests. When the buffalo belonging to one family (Household 67)[2] participating in the dietary
[252] survey died, some of the meat was used fresh for curry, much

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[443] [1] Meat such as water buffalo and pork as well as fish was sold by venders. Since meat was relatively expensive and was usually used in small amounts with other foods, it was offered for sale in chunks which no longer resembled the living animal. Seeing such small quantities spared the sensibilities of the Buddhists who were thus removed a step from the
[184] killing. Actual butchering was done by Moslems or Chinese who did not object.

[26] [2] Households were identified by numbers assigned by lot.

231 was given away fresh to selected kin and friends, including
262 those who helped to butcher, and the remainder was salted
784 and dried. Of this, 7 kg. were kept and 5 kg. sold. Moslems
184 are forbidden to eat an animal with two or four legs which
252 "dies," although eating dead locusts or fish is not forbidden.
437 Some Moslems in Bang Chan reported offering dead animals to
Buddhists in barter for other materials.

231 Oxen, a sign of prosperity, were bought as calves by
184 the Moslems and fattened for meat, usually with a ceremony in
659 mind. In 1955 (Goldsen and Ralis, 1957) only 5 householders
184 in Bang Chan raised hogs, and 4 of these had 1 or 2 only.
262 Moslems ate no pork. A permit from the district officer was
356 necessary for slaughtering a buffalo or an ox but not for
hogs. Natural deaths of such animals were supposed to be reported.

235 Poultry was not commonly used for food in Bang Chan.
262 It was the poor man's "feast" food suitable for guests. One
434 couple in the lowest income level killed one chicken or a
duck once a year to provide the traditionally good meal for
their cooperative harvest helpers. Others, better off, might
serve chicken especially at men's dinners. Pigeons were
235 raised for sale in the market by one Moslem family. In 1953-
177 54, one person was trying to raise a few turkeys for sale, as
word had reached Bang Chan that turkeys were in demand for
577 foreigners' holiday dinners. By 1957 turkey-raising for cash
was spreading, but some villagers objected to having them
around "because they look like vultures and bring misfortune."

224 Various wild creatures were used for food whenever they
225 were caught. Turtle curry was considered a great delicacy,
262 but as turtles, which could be caught from May to February,
543 brought a good price in Bangkok, experts usually sold their
catch. Frogs and turtles were sometimes kept in a jar until
needed. Eels, frogs, cobra and other snakes were used for
curry. Field rats, available all year, were roasted.

226 Fish. - Next to rice, fish constituted the most abun-
262 dant food in the diet in Bang Chan. Either fresh or preserved,[1] they were available throughout the year. Killing

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251 [1] According to observation in 1952-54, fish caught in excess of immediate needs were preserved for later use. Serpentheads ((1)plaa (3)chauaun), which are about 7 or 8 inches long, and pilot fish ((1)plaa (2)sa-(2)lid), about 4 or 5 inches long, were commonly salted and dried. Heads and tails were removed and the fish were split open and salted overnight. The following morning the fish were washed and spread on fiber trays in the sun to dry. Some excess fish might be dried at anytime of year, but larger quantities were done during the hot, dry season. The process was usually complete within a week.

Killing
262 fish was apparently regarded more lightly by many Buddhists
226 than killing of larger animals, but fishing on (1)wan (4)phra,
[794] the weekly holy day, was forbidden. Fish were caught from the
canal with nets, traps, spears and hooks. Some were trapped
226 in trenches in the rice fields. Techniques varied with the
varieties of fish mature and plentiful at different seasons.[1]
228 Moreover, every house had a fish pond. It was usually the
hole from which earth had been removed for mounding the home
site, and was connected by a ditch to the canal. Fish were
lured from the canal into the pond by clearing it of injurious
undergrowth, planting appropriate fish-feeding plants, of

251 Smaller fish were preserved as fermented fish. The fish
with bones left in, were salted overnight. This product was
[263] called (1)plaa (1)raa. For fermented fish to be used as
seasoning, in various dishes, the liquid was drained off, then the fish were washed and mixed with salt and specially prepared rice. This had been soaked overnight, fried and pounded. The mixture was allowed to ferment in a small jar for from 2 weeks to 2 or 3 months, depending on the product desired. Large bones were removed by putting the product through a colander before use. Fermented fish had the advantage that it could be eaten without further preparation, and the flavor was generally liked.

Small shrimp, which were caught in quantity during only about 3 weeks in February, were made into shrimp paste as follows: the shrimp were washed, mixed with salt and allowed to stand overnight. The liquid was drained off, and the shrimp were spread out on trays and exposed to the sun for a day or so. Larger ones might then be beaten to loosen the shells, which could be winnowed away. For very small shrimp, this step was omitted. The shrimp were then pounded thoroughly in a mortar, and stored in a jar for about a month before use. Very small fish were sometimes made into fish paste in the same way. The yield was about 2 kg. of the tannish or grayish colored shrimp paste from 4 baskets (4/5 tang) of shrimp. Shrimp paste or (2)ka-(2)pi was an essential ingredient of Thai hot dishes.

The liquid which was drained off from the mixture of
fish or shrimp and salt in the first stage of preparing fer-
mented fish or shrimp paste was used by some villagers to pre-
pare (4)nam (1)plaa or fishsoy. The liquid was boiled with
certain green leaves such as mango leaves, onion, garlic and
salt for from 30 minutes to an hour, then it was strained.
[263] The resulting red-brown liquid was bottled and was ready for
use as a condiment.

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[136] 1. Sharp et al. (1953, pp. 185-196) described some common fishing techniques and listed 32 varieties of fish known to be found in Bang Chan in 1948-49.

228 which the leafy vegetable (2)phag (2)ka-(2)cheed is one, and digging a deep hole at its entry. At the proper time the opening was plugged. The fish grew in the pool and were taken as needed, sometimes, for convenience, several at a time, to be kept alive in a large pot near the house. By draining the pond fish were "harvested" (p. 12). Yields varied, but villagers had the impression that they had de-
[654] clined considerably over a period of years.[1] In 1952, at the suggestion of FAO, the Thai government tried to increase the supply by introducing tilapia culture. During the first three years of the experiment about one-third of the families in Bang Chan had tried to raise tilapia, but in the summer of 1957 members of the research group were told that no one had persisted (see Appendix A, p. 101).

235 Eggs. - Chickens were raised by about 90% of the families in Bang Chan, and over 70% owned 10 or more. In contrast, only 37% of the households had ducks, and only 13% had 10 or more (Goldsen and Ralis, 1957, p. 56). Ducks were regarded as trouble makers. Moreover, chickens could feed "naturally" and certainly helped themselves to paddy from the bin, whereas ducks did not eat paddy, but had to be provided with bran and broken rice.

235 Most of the eggs produced were sold. Janlekha (1955)
443 estimated the annual production of chicken eggs in Bang Chan
433 as 366,540, and that of duck eggs as 268,200 eggs. According
262 to the information which Janlekha obtained from 106 households in 1953, about 4/5 of the chicken eggs were sold as a secondary source of farm income whereas more than 3/4 of the duck eggs were home consumed. Slightly over 2/5 of all eggs produced in the village were consumed there. On a per capita basis, the average annual consumption of 708 eggs for an average family size of 5.7 persons (Janlekha, 1955) amounted to a little over 1/3 of an egg per day. Home consumption of eggs might be less in households in which enough chickens were raised to make regular sale of eggs possible. Thus in 5 of the 31 households studied by Sharp et al. (1953, p. 197) all hen's eggs produced were consumed at home.[2] For these families, an average of 452 eggs per family per year or about 1-1/4 egg per family per day, were thus available. Home consumption in the 26 families which sold eggs amounted to an average of 215 per year or about 0.6 egg per family per day. One informant commented that a rich man could eat an egg every day, but she could not afford to do so. She said she sold eggs, when she had them, and bought foods to eat with rice.

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[1] Sharp et al., 1953, pp. 191-192.

[2] This probably means that eggs were not sold in quantity, not that none were used in barter (cf p. 5); thus the number of eggs available may be overestimated.

244 Vegetables and Fruit. - Although kitchen-gardening has
been encouraged by the Thai government, vegetables and fruit
were grown in Bang Chan to a limited extent only. Every family
had some sort of kitchen garden, but many edible plants which
can be grown in the village were grown by relatively few families.
[433] The list of fruits grown in Bang Chan in 1948-49 (Sharp
et al., 1953) included four times as many items as were grown
by one or more of the 11 families that participated in the
dietary study. The list of vegetables and spice plants grown
or gathered by these families included 27 items, as compared
[249] to 41 listed by Sharp et al. Spices and chili were more commonly
grown than vegetables and fruit.[1]

244 One affluent household whose food expenditures for 1949
245 were reported by Sharp et al., (1953, pp. 214-215) produced
433 for home use, 125 kg. of palm sugar valued at 200 baht and
500 coconuts, valued at 450 baht. Home production of both of these was unusual. Few families in Bang Chan grew either sugar palms or coconut palms and expenditures for coconuts and palm sugar were usual. During the major flood of 1942, villagers noted that coconut palms survived whereas all other fruit trees were destroyed. After this, a number of farmers planted coconut palms, but they had not yet begun to produce.

361 In 1954, about 120 acres (300 rai) of the total of about
311 2800 acres (7000 rai) of land in the village were used for
[351] home sites and home gardens for 336 households. Individual
home sites usually varied in area from about one-quarter to one acre, and were occupied by buildings, threshing floor and space for poultry as well as trees and garden space. Portions of this might be under water for several months of the year. Increased home production of fruit and vegetables would in many cases necessitate increasing the size of the home site by purchase, mounding or both. Ordinarily, increased land for the kitchen garden was obtained at the expense of some of the

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[245] [1] In a typical farm garden in Bang Chan one would find
bananas growing, and a number of plants used for seasoning
[249] curry. Various kinds of chilies, lemongrass, bergamot, of
which both rind and leaves are used, and galangal were grown
by all families who participated in the dietary study. Both
sweet and holy basil were commonly grown. Many families grew
one or more varieties of gourds and of eggplant, some of which
• [262] can be trained to grow on a tree or trellis. The inflorescence
of the banana was also used as a vegetable. Leafy vegetables
were not commonly cultivated but some families grew
(2)phag (2)ka-(2)cheed, a green water plant, in gardens staked
out at the edge of the canal, or in a pool, and some had trees,
[222] the leaves of which were edible. Swamp cabbage or (2)phag
[262] (3)bung grew wild along the edge of the canals and was the
most commonly used green leafy vegetable. A few families
[245] grew guava, jujube, star gooseberry, Manila tamarind, mango
and pineapple.

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361 rice land. Water-ways, however, were public areas, and any [505] convenient wide spot might be selected as a private garden. It was marked with stakes, and was apparently not disturbed by others.

• 262 Mushroom culture as a side line activity of rice far- 344 mers developed during the period when this study was in 433 progress. After threshing, in early 1954, two of eleven families that participated in the dietary study started raising mushrooms. Although most of these were sold, both families reported frequent inclusion of mushrooms in the family diet. One informant commented that families that planted mushrooms also ate them almost every day, and said "Adults complain that it is a wearisome food but children still like it." Mushrooms were used fried, with pork, in soup or in curry.

[434] As with tilapia, mushroom culture appears to have been undertaken primarily to increase cash income, and was abandoned when it was no longer profitable financially (see Appendix A, pp. 101-102).

Food Purchased and Cash Expenditures for Food

262 Relatively few foods were purchased, but some of these, 432 such as onion, garlic, limes, tamarind, coconut and palm sugar were so frequently used that without cash to buy them, villagers would have considered their diet monotonous. Many had their own supply of fresh and dried chilies, fishsoy, and shrimp paste, which might, however, be inadequate for their needs. Other foods not commonly produced in Bang Chan were purchased for variety.

262 Estimates of mean annual consumption and cost of pur- 435 chased foods, for 106 households in Bang Chan are shown in 128 Table 1.

262 The list of purchased foods presented by Janlekha (1955) 432 was compiled after preliminary interviews with a number of household heads. It includes the principal food items which were commonly purchased in Bang Chan. In addition to these, the affluent household studied by Sharp et al. (1953) spent appreciable amounts for vegetables (listed as cucumbers, lettuce, cabbage, etc.) and fruit (pineapple, mangoes, melons, etc.) and small amounts for peanuts, soy sauce and vinegar sauce. Eggplant and white radish were bought by more than half the families that participated in the dietary study, and were used on 11 and 8 survey days respectively. Other vegetables and fruits, bought by one or two of the 11 families, and used on not more than 3 of the 44 survey days were: mung beans, snap beans, bean sprouts, Chinese celery, cucumber, leeks, lettuce, mushrooms, sugar cane, sweet potato, taro, turmeric, (2)ma-(1)faj or rambai, Thai nutmeg, orange, pineapple, rambutan, sandorica and watermelon. Salted and pickled white radish and pickled bamboo shoots were the only

[Text continnues on page 23;--Analyst]

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Table 1. Mean Annual Consumption and Cost of Purchased Foods, for 106 Households[1] in Bang Chan, 1953
(Adapted from Janlekha, 1955, p. 316)

Foods purchased	Estimated Amount		Estimated Cost baht[2]
Raw fish	16.6	kg.	83
Fish sauce (fishsoy)	36	bottles	54
Shrimp paste	6	kg.	27
Pork and beef	8.4	kg.	84
Vegetables	1	kg.	1
Onion[3]	11.3	kg.	34
Garlic[3]	11.3	kg.	34
Coconut[4]	196	fruit	292
Chilies, dried	7.6	kg.	53
Limes[4]	80	fruit	16
Tamarind[4]	6.3	kg.	19
Palm sugar[3]	71.4	kg.	152
White sugar	4	kg.	16
Total			865
Average cost per day			2.53
Average cash expenditure per person per day for food			0.44

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[1] Average size, 5.7 persons.

[2] At the time of the study, one baht equaled about 5 cents.

[3] Not produced in Bang Chan (Sharp et al., 1953, pp. 295 and 299).

[4] Little production in Bang Chan.

262 preserved vegetables which were purchased and used frequently
432 by families participating in the dietary study.

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435 The food costs reported by Janlekha (1955) were estimates recorded from memory at relatively frequent intervals. The average per capita cost, 0.44 baht per day, was similar to the average cash expenditure of 0.47 baht per person among 11 families participating in the dietary study (based on the average of 4 survey days for each family). Thus, in Bang Chan, cash expenditure for food appeared to be relatively small, i.e. farm families produced a large share of all food consumed. If money were not available to buy, they would still have enough to eat, but it might lack variety. One informant said, for instance, that he usually bought a coconut every other day, but during October, when cash was short, he bought none. Janlekha (1955) considered the estimates obtained for expenditures for fruits and vegetables less reliable than for items purchased more regularly.

262
511 In Table 2, the percentage distribution of food

Table 2. Division of Food Expenditures by Food Groups, for Eleven Families that Participated in the Dietary Study, 1953-54

	A 6 families[1] %	B 5 families[1] %
Animal foods	30.8	39.3
Fruits[2]	30.3	26.3
Vegetables[3]	28.7	17.0
Fats and Oils	3.3	8.4
Sugar	3.6	3.5
Pulses, nuts	--[4]	0.9
Spices, etc.	2.7	--[4]
Miscellaneous	0.7	4.5

1. Based on 4 days per family.

2. Primarily coconut.

3. Chiefly non-leafy

4. The dash indicates no purchase or a value of less than 0.1%.

262 expenditures by food groups is shown for the 11 families that
511 participated in the dietary study.

Consumption of canned foods was negligible. Some canned fish and fruits were on sale at stores in the village, in 1952-54, but were seldom seen in homes.

262 Sweetened condensed milk, which was served in coffee
272 sold at the stores, was occasionally bought for the children.
854 On one occasion, a woman was seen buying milk diluted with
855 hot water as a beverage. Among 526 records of food eaten by school children during 24 hour periods, milk appeared twice only, once with coffee. Dried milk, for infant feeding, was used occasionally. During 1952-54, several instances were noted in which dried milk, mixed with water, was used to feed an infant while the mother was at work in the field or engaged in vending, but we encountered one case only of an infant who was not breast fed. This was an infant whose mother died when he was five days old, and who was reared by grandparents.

262 Relatively few items of food were available at the vil-
443 lage stores. In the inventory of the largest of the three
[27] stores in the village in 1948-49 (Sharp et al., 1953, pp. 211-212) the following items of food were listed: big dried chilies, shrimp paste, onion, garlic, fish sauce (fishsoy), salted fish, fresh chilies, limes, coconut, coconut oil[1], brown (palm) sugar, tea, coffee, condensed milk, orangeade and lemonade (carbonated), sweets, liquor, ingredients (including a lime paste) used together in betel chewing.[2]

New stock received in December by a local vender who kept a few items for sale at her house included mature green beans, black beans, peanuts, sweet potatoes, salted turnip, pickled garlic and tomato sauce.

272 Larger stores served as informal men's clubs where tea,
443 coffee with condensed milk, and carbonated beverages were
575 sold primarily for consumption on the premises. The proprietor of a new store, built in December 1952, sold no liquor.

273 We have no estimate of the amount of liquor sold in Bang
443 Chan, although for those who drank it, its caloric value might
[42] be of significance.[3] About 9% of the householders interviewed

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[354] [1] Listed by Sharp et al. with non-food items, as much of it was burned in lamps.

[2] Included here as food since some calcium may be obtained from this source.

[3] One observer estimated the intake of certain village men who drank regularly as at least 2 oz. of rice liquor (28-35% alcohol) per day, representing about 100 calories. The estimated intake of women who drank regularly was about 1 oz. per day.

273 in 1955 (Goldsen and Ralis, 1957, p. 57) said they drank whiskey often, 22% drank occasionally, 47% seldom, and only 22% said they never drank it.

Sale of Home Produced Foods

433 434 443 Although a majority of the families in Bang Chan made most of their cash income by rice farming, sale of other home produced foods, fish, and food materials such as swamp cabbage and lotus stems which grew wild in the canals was a minor but relatively steady source of income for many families. Six of the 11 families that participated in the dietary [562] study obtained some income from sale of food[1]. The woman frequently had major responsibility for these activities. As noted by Sharp et al. (1953), a few poor families only, added to their income by selling fish.

121 In connection with this study, our concern with sale of home produced foods is primarily with the nutritional rather than the economic aspects,[2] although the two cannot be completely dissociated. Do activities of this sort on the part of some families make a greater variety of foods available to the villagers as a whole? Are some foods sold for cash which from the nutritive standpoint, might well be kept for home use? If so, is the cash thus obtained used to purchase other foods or non-food items? Is the food purchased as useful, from the nutritive standpoint, as that sold? From the standpoint of improving the nutritive value of the diet of Bang Chan families in general, would more home production of fruits, vegetables, fish and eggs by most families be feasible, or should a few families be encouraged to develop these activities on a year round basis, to increase the local supply of food other than rice? Questions of this sort must be considered by anyone attempting to improve food habits in the village.

Annual Calendar of Foods Commonly Used

221 262 126 [129] From the records extending over the period of a year, of foods used by various families participating in the dietary study, and from food records provided by children in the health classes in December 1952, February, May, June, July, September, October and November 1953, and January 1954, a calendar has been constructed showing the approximate times of year at which the foods most commonly used in Bang Chan were available (Chart 2). Foods included in this chart were

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[1] See Table 8, p. 62.

[2] See Janlekha (1955).

[Text continues on page 29 -- Analyst]

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Chart 2. Annual Calendar of Fresh Foods Commonly Used in Bang Chan[1]

	No.[1] Records	May	June	July	Aug.[2]	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[2]	Apr.[2]
Fish													
Climbing perch	114	x̲[3]	x	x		x̲	x	x	x	x	x		
Eels	27	x	x	x		x	x	x		x	x		
Field crab (salted before use)	16	x					x̲	x		x			
Oysters	22		x	x̲			x			x			
Notopterus notopterus	10	x						x	x		x		
Serpent head	99	x̲	x	x		x	x	x	x	x̲	x		
Silurus	66	x̲	x	x		x	x	x	x	x	x̲		
(1)plaa (1)thuu	163	x	x	x̲		x̲	x	x̲	x̲	x			
Other Animal Foods													
Beef	30	x				x	x	x	x̲	x	x		
Chicken	72	x	x	x̲		x̲	x	x		x			
Eggs	142	x	x	x̲	x	x̲	x	x̲	x	x̲	x̲	x	x
Frogs	18	x	x̲	x				x		x			
Pork	51	x	x	x		x	x	x	x	x	x		

1. Based on 539 records obtained from school children, and observations in 11 households on 44 survey days. Figures in the column headed No. Records indicate the number of 1-day records on which the item appeared.

2. No records were obtained from school children during March, April or August, hence absence of the item from these columns means simply that the 4 households visited in each of these months did not use the item.

3. x̲ indicates that the item appeared frequently on records obtained in this month. Note that frequency of use may be influenced by farm work and circumstances other than relative availability.

Chart 2. (continued)

	No.[1] Records	May	June	July	Aug.[2]	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[2]	Apr.[2]
Green and Yellow Vegetables													
Basil, sweet		x	x	x	x	x	x	x	x	x	x	x	x
Chili, fresh		x	x	x	x	x	x	x	x	x	x	x	x
(3)Khii-(2)leg	10			x		x	x	x		x			
Lettuce	49	x	x	x		x	x	x		x	x		
(2)Phag (2)ka-(2)cheed[4]	138	x	x	x	x	x	x	x	x	x	x		
Pumpkin	19	x	x	x				x		x	x		
Snap beans	12	x	x	x	x				x	x	x	x	x
Swamp cabbage	147	x	x	x	x	x	x	x	x	x	x	x	
Sweet potato	72			x	x	x	x	x			x		
Other Vegetables													
Bamboo shoots	53	x	x	x	x	x	x	x	x				
Banana, inflorescence	25	x	x	x		x	x	x		x	x		
Calabash	31	x	x	x		x					x		
Cucumber	10		x	x				x			x		
Egg plants[5]	29	x	x	x	x	x	x	x	x	x	x	x	x
Garlic		x	x	x	x	x	x	x	x	x	x	x	x
Gourds, bitter	11			x	x					x			
Gourds, towel	11	x				x	x	x					
Lotus stalks	48	x		x		x	x	x	x				
Mushrooms	25	x	x	x		x	x	x		x			
Onions		x	x	x	x	x	x	x	x	x	x	x	x
West India pea tree flowers	39	x					x	x	x	x	x		

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[4] Thai names are given when English equivalents are not known. For scientific names see Appendix C, pp. 126-127.

[5] Several varieties of egg plant were used. On many records the variety used was not indicated.

221 listed on 10 or more of the 24-hour dietary records obtained.
262 For items which were major ingredients, the number of records
126 on which the item appeared, is given.[1] Thus (1)plaa (1)thuu,
[128] which is bought by residents of Bang Chan during the busy
work seasons, was used more often than any other single variety of fish named. Of the varieties caught locally, climbing perch, serpenthead, and silurus were most commonly used. Fermented fish, not included in the calendar, appeared on 53 records, and fish with kind not specified, on 180. Eggs were used more often than any animal food other than fish. Among green vegetables, swamp cabbage and (2)phag (2)ka-(2)cheed were commonly used. Bamboo shoots and lotus stalks were prominent among the non-leafy vegetables. Bananas which are grown in every garden and are available all year round were much the most common fruit, although other seasonal fruits were eaten more often in 6 of the 9 months in which school children submitted records.

262 Some idea may be obtained of peak seasons for use of
126 various common foods by noting the months designed by x.
128 Thus in January and May, serpentheads were listed on about 1/3 of the records, and were frequently served at more than one meal. Sweet potato, usually fried and eaten as a snack, was listed on 35 of 52 records obtained from school children in September. Flowers of the West India pea tree were listed on 10 of 55 records in October, and 12 of 88 in November, with occasional mention on records obtained in 4 other months.

Fruits were eaten much less often than one might expect in a tropical area where many varieties are available and
262 fruit can be grown the year round. They were most often
855 eaten by children as snacks, although pineapple and papaya
[252] were usually, and banana occasionally cooked in "with-rice" dishes such as curry. In September, fruit was included in the diets of less than 1/3 of the children. An average of more than one serving of fruit per child per day was recorded in 5 months only, May, June, October, November and February. In May, when (4)ma-(1)faj or rambai was in season 46 of 76 children reported having eaten it. Pineapple, listed by 35 of 61 children in June, was most often served in curry at one or more of the family meals. In October, oranges were eaten by 30 of 55 children who submitted records. Bananas (mostly of the (4)nam-(4)waa variety) topped the list in November and February.

262 Items mentioned on fewer than 10 records, and hence
128 arbitrarily omitted from the chart, are worth noting as they

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[263] [1] No figures are given for sweet basil, garlic, onions, chili or limes, which were so often used in small amounts as seasoning that the count obtained would give no clear idea of the extent of their use. Some common spice plants were not mentioned on the records.

262 might provide clues to ways in which the diet may be improved.
128 Most of these items were included in lists given by Sharp et
al. (1953)[1]. To those lists should be added the following
items from our food records:

Green leafy and yellow vegetables: Leaves of bergamot, chili, morinda, onion, potato, pumpkin, (2)sa-(5)noo, and of the following trees: (2)ma-(1)dan, (4)khlyb[2] and West Indian pea tree; (2)kha-(1)cauaun flowers.

Other vegetables: flowers of leek and pumpkin, and Chinese or black truffle (water chestnut).

Fruits: Thai nutmeg and tomato.

Fresh foods other than fish: buffalo, duck, cobra, turtle and field rat.

128 At the end of Chart 2, sources of water for drinking and food
312 preparation have been included, not only because water is
271 properly considered a nutrient, but also because the water
used in preparation of food may affect the wholesomeness of
foods eaten raw or with little cooking.

271 Untreated water was the customary beverage with meals.
[846] Ordinarily no distinction was made in source of drinking water
[853] for children and adults although boiled water was given to
mothers and infants to drink during the post partum rest
[158] period (Hauck, 1956). Occasionally a sick person would be
given boiled water to drink; for example one man who said he
was "a little sick" and "not working" was observed to drink
[272] hot boiled water from a thermos bottle. In 1955, Ralis[3] found
that tea was seldom or never drunk by nearly 3/4 of the respondents. Less than 7% drank it frequently. Thus in Bang Chan
no custom had grown up which would afford the general population with a measure of protection against infection from

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[114] 1. See Sharp et al., 1953, pp. 193-196 for a list of 32
[136] fish known to be found in Bang Chan; pp. 293-294 for 34 fruits
[244] grown in Bang Chan, and p. 295 for 11 fruits known to be used
[245] but not grown there; pp. 296-298 for 41 vegetables grown in
[262] Bang Chan, and pp. 299-300 for 24 other vegetables used.

[824] 2. (4)Khlyb was the term used in Bang Chan for an uni-
[252] dentified tree of the family Leguminosae. Its sweet tasting
leaves were washed in boiling water to get rid of a bad odor,
then were eaten with (4)nam (4)phrig, a chili sauce.

[114] 3. Golden and Ralis, 1957, p. 57. The answers to:
[126] "Do you drink tea frequently, occasionally, seldom or never?"
[272] were: often, 22; occasionally, 68; seldom, 158; never, 85.

252 a woman's" (Sharp et al., 1953, p. 88). For instance, the
462 husband cooked when his wife was away from home, e.g. selling
in the market or in farm labor, and of course when she was
252 sick or resting after childbirth. The ability of boys as well
867 as girls to cook rice and some of the accompaniments was taken
for granted. A girl or boy could cook rice "as soon as he
could lift the rice pot," e.g. at 6 or so; by age 12 he could
cook a creditable meal. In mid-December, 1952, on the last
day of school before vacation, one of us saw committees of
school children (aged 7-14 years) preparing food for a special
meal, on the school grounds. The variety of dishes prepared
and the ease with which the children went about their tasks
gave evidence of the home experience these children had had
252 (Hauck, 1953). Responsibility for food preparation increased
[383] with age up to about 15 years, after which all available able-bodied
family members did field work during the busy seasons
(cf. p. 11). Several hours per day were spent in cooking and
by middle age, parents were eager to turn this job over to a
[597] daughter or daughter-in-law. If they had no daughter, this
was an explicit reason for adopting a baby girl.

252 Certain men of eminence, e.g. headmen and elders, would
554 not be asked to cook at all, but as they aged, they might return
881 to the task. One old headman, all of whose children had
married and left home, said that he was doing the cooking for
252 2 months because his wife had back trouble. Some dishes were
562 cooked by men only, even when their wives stood by: turtle,
frog and cobra curries, for instance. These were also food
for men only, suitable to serve at a drinking party.

252 A premium was put on good cooking, and certain women
261 who were noted for their cooking were in great demand for large
[868] scale food preparation during the ceremonial season. One farmer
planned to send his daughter to learn from such a skilled
cook, having in mind the food preparation which would be
needed when his sons were old enough to be ordained. Adverse
comments might be made if the food did not come up to expectation;
thus, a small boy complained that his curry was "too
salty," and an old woman said loudly that the curry made by
her 16-year old grand-daughter was "not good," although this
girl was the only one at home to cook.

Meal Patterns[1] and Preparation of Typical Thai Dishes

252 Food was commonly prepared twice a day, in the morning
264 and late afternoon. The meal pattern was the same for breakfast

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114 [1] Suvarnakich (1950) described the Thai diet in a
262 general way and Sharp et al., (1953, pp. 263-274) summarized
the small amount of information on diet in Bang Chan obtained
during the preliminary study in 1948-49.

252 and dinner, either meal taking an hour or two to prepare. 264 Snacks might be eaten at any time. Adults often ate just the two principal meals, but children, especially the small ones who were not in school, might eat whenever hungry. The school children often purchased snacks from venders on the [792] school grounds. If food was to be offered to the priests, [852] who went around the village about seven o'clock in the morning, breakfast preparation was begun early, between 4:30 and 5:30 a.m., although family members might eat at various times during the morning: the husband before he went to the field, older children, before school time, babies and small children when the mother had time to feed them, and so on (Appendix A, p. 95). Preparation of supper usually took place sometime between 2:30 and 6 p.m. Whenever possible, family members ate together at the evening meal, but many exceptions were noted.

252 Rice is the principal item in every Thai meal. In Thai 262 the general term meaning "to eat" is translated literally "to eat rice." All food items are divided into two classes: rice and "with rice," or (2)kab (3)khaaw. Among the families studied three or four "with-rice" dishes were usually prepared during the day, i.e. for the two main meals, but the number varied in different families, and according to season. One or two of these dishes would usually be "hot" i.e. highly seasoned with fresh or dried chili peppers. Fish was the food item second in importance to rice, but the typical "with rice" preparation, whether hot or mild, contained more than one food item in addition to a variety of spices and flavoring materials (Appendix C, p. 118).

262 Between meal snacks might be any available leftover 264 food,[1] fruit, or items purchased from a vender.[2] Such snacks were not regarded as meals, however, as no Thai considers that he has eaten a meal unless he has eaten liberally of rice.

252 The general method of cooking rice was the same throughout the village. The rice was washed two times in water from the canal or fish pond, and was then boiled in a large volume of unsalted water for about 24 minutes. The rice pot was

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1. Leftover foods from breakfast were eaten later that day with or without reheating. "With-rice" was seldom left over from the evening meal, but rice was frequently kept over night.

[252] 2. Deep fat frying of bananas, sweet potato slices and the like was commonly observed, both among venders who sold their wares on the school ground, and those who travelled by boat. This method of cooking was never observed in ordinary home food preparation probably because fat was in relatively short supply.

The observer often had
126 opportunity to make notes on foods eaten by various family
262 members. Two examples of these are included in Appendix A,
p. 97.

Snacks

262 We have noted that various family members ate the morning
264 meal, in particular, at different times, and that children
[855] especially might eat leftover food between meals. Most Bang
Chan school children[1] ate snacks, which were usually different
[443] from foods eaten at a regular meal. Doubtless most of them
were purchased from one of the venders who were to be seen on the school grounds daily. Fruits and "desserts" were most commonly eaten, although a variety of other foods, not a part of the usual Thai meal, were also listed. Sweets were listed about 450 times on the 539 records obtained. Many of them had a base of rice, rice flour or glutinous rice with sugar, and included coconut, banana or other fruit. Some were made with legumes, and a few contained egg. Fried bananas, fried sweet potato slices, bananas or beans cooked in syrup, and bananas cooked in sweetened coconut milk were also listed. A few items such as ices, flavored syrup poured over shaved ice, and candies, had little nutrient value other than caloric content.

272 A glass of milk, and milk with coffee, were each listed
once. These might have been obtained at the store adjoining
the school grounds. These instances are worth noting primarily
[854] because, although dried and tinned milks were obtainable,
milk was seldom given to village children after weaning.

262 Many children were given a bit of cash each day, and
437 Janlekha (1955) commented that some children who did not have
855 any might barter an egg for snacks. One could tell fairly
[261] well from the children's records what the venders offered for
sale on a given day. Some influence of season was apparent; thus ices and syrup over shaved ice were eaten more often during the hot dry season, and cooked foods such as fried Chinese noodles appeared primarily in the cool season.

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[126] 1. With the cooperation of teachers of the third and fourth grades in the Bang Chan elementary school, records of food eaten during 24-hour periods were obtained from children in these grades at intervals of about one month during the school year. This was a regular activity in the health class. A total of 539 records (from 1 to 8 for each child) were obtained from 75 boys and 72 girls. To facilitate recording, each child was given a sheet of paper, with spaces for his name, the date, and kinds of food other than rice, eaten at the morning, noon and evening meals, and as snacks. These records were collected primarily for information on meal patterns of village families for comparison with the limited sample in the dietary survey, and on seasonal use of various foods.

262 Some snacks, i.e. seasonal fruits, may have been picked from the home garden, and items such as lotus seeds were probably gathered wherever the children found them.

Comments on Foods Eaten by School Children

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264 In addition to the high percentage of school children who ate snacks, a conspicuous observation was that many ate
855 no regular lunch (Table 3). We did not ask the children to record when they ate snacks, but only what they ate. The number of snacks recorded by individual children did not, however, appear to be related to whether or not they had eaten lunch. For example, among the 76 children who provided 24-hour food records during May, 1953, the average number of snacks recorded by the 39 children who ate a regular lunch and the 37 who did not, was about the same, i.e. a little over three per child.

Table 3. Number and Percentage of Children Who Ate Snacks, and Who Missed Lunch, Arranged by Months in Which Records Were Obtained

Month[1]		No. of Records	Children who ate snacks		Children who missed lunch	
			No.	Percentage	No.	Percentage
May	1953	76	73	96	37	49
June	1954	61	56	92	32	53
July	1953	79	77	98	53	67
Sept.	1953	52	49	94	36	69
Oct.	1953	55	50	91	22	40
Nov.	1953	88	81	92	57	65
Dec.	1952	18	14	78	10	56
Jan.	1954	69	64	93	41	59
Feb.	1953	41	39	95	33	81
	Total	539	503	93%	321	60%

[1] Note that although the figures are arranged by month, the records were obtained over a period extending from December 1952 through June 1954.

264 855 [262] Most of the children who ate lunch regularly brought rice and some of the "with-rice" dishes prepared for a family meal in a lunch pail. Menus for breakfast and noon meals were often identical. Children who lived at a distance may have found it harder to carry lunch, especially when they had to walk to school, but the month by month record of the percentage of children who missed lunch (Table 3) does not indicate any clear seasonal trend. Even children who lived nearby might neither bring lunch nor return home during the noon recess. We were at the home of a school teacher, a short distance on foot from the school, when his two children returned in the afternoon. The mother said that they usually waited until after school to eat, but were having no snack on that day because for the first time, they had carried lunch to school.

126 262 Thorangkul (1957) scanned all of the dietary records to note the frequency with which the following food groups occurred: protein-rich food, carbohydrate-rich food other than plain boiled rice, vegetables and fruits. She considered the records of each child as a unit; thus if a boy for whom 5 daily records were available, had recorded protein-rich food such as fish, eggs, or beans 16 times, he was regarded as having more than 3 "servings"[1] of such food per day. The frequency with which various food items occurred in the daily diets of these children is shown in Table 4.

Considering the day's record as a whole, some protein-rich food, usually fish, was included in the records of 97% of the children. Such protein-rich food appeared two or more times per day in the records of over 80% of the boys and about 90% of the girls. In contrast, no fruit was mentioned in the records of about 10% of the children, although fruit was one of the commonest snacks. Vegetables were not mentioned in the records of 10% of the boys and 3% of the girls. Only about one-fourth of the vegetables recorded were green or yellow.

For 75 children for whom we had 4 or more records, Thorangkul (1957), to obtain a rough estimate of the adequacy of the children's diets, grouped the records into three categories, based on the number of times protein-rich foods, vegetables and fruits appeared. On the average, children whose diets were placed in Class I had at least 3 "servings" of protein-rich food, 3 "servings" of vegetables and 2 of fruits. Diets in Class II included some from each of the food groups each day, but the items were recorded less frequently than in diets in Class I. Diets in Class III did not include foods from each of the food groups emphasized, each day. On this

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[104] [1] The term serving is used here to designate each time an item appeared in the daily food record. Thai do not have "servings" as the term is used in Western countries.

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Table 4. Frequency of Occurrence of Various Food Groups in the Daily Diet of 147 School Children in Bang Chan

(Adapted from Thorangkul, 1957)

Number of servings[1]	Protein-rich food	Carbohydrate-rich food[2]	Vegetables	Fruit
Percentage, based on records of 75 boys[3]				
3 or more	47	8	28	8
2 to 2.9	36	15	23	18
1 to 1.9	13	40	30	37
0.1 to 0.9	3	37	9	26
None	1	-	10	11
Percentage, based on records of 72 girls[3]				
3 or more	68	13	21	10
2 to 2.9	21	17	38	27
1 to 1.9	4	22	34	38
0.1 to 0.9	3	48	4	15
None	4	-	3	10

1. The term serving is used here to designate each time an item appeared in the daily food record.

2. Other than plain boiled rice, which is an essential part of every Thai meal.

3. Average frequency of occurrence was computed, considering the records of each child as a unit.

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basis, nearly a third of the children who provided diet records had diets which were classed as III (Table 5). Almost all of the girls and about 4/5 of the boys in this group missed lunch. Indeed the common habit of eating just two main meals, with snacks, was probably one important determinant of the number of servings of protein-rich foods and

Table 5. Diet Classifications for 75 School Children in
126 Bang Chan, and Percentage of Children with
264 Each Diet Classification who Missed Lunch

(Adapted from Thorangkul, 1957)

Diet classification[1]	Percentage of children	Percentage of children who missed lunch	
Class I	8	Boys	46
		Girls	45
Class II	61	Boys	73
		Girls	68
Class III	31	Boys	81
		Girls	98

1. See text for basis of classification.

264 vegetables eaten, since items from these two food groups were
126 not commonly eaten as snacks. Note, in the illustrative
262 records presented in translation (Appendix A, p. 98). that the
child whose diet was considered to be in Class III did not eat
a regular lunch on any of the six days for which records were
available, whereas the child whose diet was classified as I
ate a regular lunch six times out of seven.

Family Food Shared With Others

264 Throughout the year families prepared especially good
476 meals for persons who came to work cooperatively with them.
Every rice-grower entertained his cooperative harvest crew,
[466] some the transplanters. Hired laborers were not usually served
such feasts, but the conviviality of the harvest season called
[435] for a round of liquor even for them. One harvest dinner for
48 cost 50 baht, plus eels (60 baht) and rice. Cooperative
[256] home pounding of rice was still practiced in some households
and thought to be fun. In one day enough rice to produce 40
[433] tang (640 kg.) was pounded by groups of 15 to 20 workers; in
an evening 20 tang were done. If 40 tang were milled, workers
were served a full meal; if 20 tang, a dessert only. Other
occasions were fish-pond draining, house raising and repair.
[262] Each participant in the fish-pond draining at Household 21
was fed (3)khaaw (3)tom (soupy rice) for lunch and "an enormous supper," in addition to receiving the traditional pot of
fish. If good food were not served at these functions people

Attitudes Toward Food

262 To older Bang Chan residents, to lack rice was to starve
[261] even though fish or vegetable fare were at hand. Since rice
262 was the staff of life, many important customs clustered about
243 it. Ceremonies to the Rice Goddess accompanied the raising,
[787] selling, and storing of rice. When the unhusked rice was in
the bin, it could not be withdrawn at any time as needed, but
astrological charts had to be consulted to make sure the day
[788] was auspicious. Paddy could never be withdrawn on Friday, a
day sacred to the Rice Goddess. After cooking, the best rice
was said to be at the mouth of the pot, so this was offered
on ceremonial occasions. Important rules were that when cooking
rice, the cover of the pot must never be laid in a mortar
and it must be inverted, never laid down flat; otherwise one
would be short of rice. One must never scrape the top of the
rice with the cover, or the "soul" of the rice would be scraped
[784] out of the pot. Moslem residents murmured an Arabic prayer
[563] every time the rice was put into the pot, and every time the
pot was put onto the fire, as well as before eating.

261 Rice has been generally regarded as the strength-giving
262 food par excellence. A portion of Chutima's (1939) description
of the "old system" follows:

> Our children and young women are forbidden by ancient doctrine from eating any fair quantity of animal products, but must eat plenty of rice which is considered as the only true food, the others being only appetizers. And to stimulate the palate, large quantities of hot and irritating condiments (chilies and peppers principally) are consumed at every meal. Some vegetables, boiled or raw, are also included, but in small quantities in spite of abundant supply.

The quotation indicates first that in the past, rice was considered much more important as food than the "with-rice"
[657] dishes. Since the Food and Drug Division of the Ministry of Public Health has been attempting to encourage the eating of more "with-rice," the attitudes found in Bang Chan are of interest. One informant stated that only rice can make children fat, and that the "hot taste" foods help them to eat more rice. Another commented that rice makes children strong, and "with-rice" makes them weak. Another, a mother of seven children, said that if babies were given too much "with-rice" they would be potbellied. The more modern view was expressed by an informant who said that a certain child ate only rice with fish, and was weak; he refused vegetables and banana. One affluent farmer, an elderly man whose orphaned grandchild was being raised on cow's milk (evaporated or dried milk, diluted with boiled water) expressed the opinion that the ancient belief was based on thrift. He said that thrifty

262 people did not want to spend much on a baby, therefore they
261 said that if a child ate too much "with-rice" he would be potbellied but thin in the upper part of the body, and that eating eggs would cause dental caries. This grandfather said he believed the truth to be just the opposite, but that goods things were expensive. As an illustration of the idea that thrift was the basis of restriction of "with-rice," one young mother said that an egg was regarded as equivalent to one (1)plaa (1)thuu (fish), and was enough for two persons. Sometimes one egg would serve an entire family. She said that a child would be punished if he ate a whole egg at a meal.

262 Secondly, Chutima suggests that particular foods were associated with, or suitable for, particular age levels, and a given sex. Data obtained in Bang Chan indicate that certain foods were associated with conditions such as pregnancy, lactation, and the puerperium, with occupation, and even
653 socio-economic levels. For infants, breast milk was considered most suitable. The newborn infant was not usually put to the mother's breast for about 3 days after birth, and if a relative or neighbor did not nurse the infant, the small banana called (3)kluaj (4)nam-(4)waa (see p. 46), raw or baked, was crushed and fed to him before his mother's milk was available. This banana and rice, as (3)khaaw (3)tom and (3)khaaw (2)piag (two watery preparations), sometimes crushed with (3)kluaj (4)nam-(4)waa, were always the first solid foods introduced while the infant was breast fed. No other foods were introduced early. Some infants received fish and egg by 6 months of age, and a majority ate these foods by the time they were a year old. Some two year olds had not yet been given vegetables, and very few infants ate them before they were one year old.

855 Giving of "holy food"[1] to children suggests concern for
[776] strengthening children through dietary as well as other ritual means.

262 At the other end of life, as old age approached, the
888 diet was supposed to change, ideally to a completely vegetarian one. Since one was soon to face death, one gave up eating meat and even fish, if possible, so as to avoid taking life. It was considered pitiful or wrong for an old person to fish. Being able to go without food was associated with merit. Those who stayed overnight at the temple on the Buddhist holy day went without solid food from before noon until the next morning as the priests did. One elderly woman remarked that when she stayed overnight at the temple she did not feel hungry, and did not eat anything at night, but other women, feeling hungry, drank coffee or milk at night. She

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[1] See p. 50.

262 understood that her merit helped her not to be hungry. Once
888 she asked an eminent layman about eating at night. He said,
"If you are not hungry, do not eat. If you feel hungry, it
is better to eat. If someone invites you to eat, it is sinful to refuse."

261 Even young adults had a strong revulsion against gluttony. One of the symptoms of a man who went mad and had to be committed to an institution was that "he ate too much." A woman was despised because "she ate in secret. She stole eggs from her husband, sold them in the market, and then spent the cash on food which she ate there, instead of bringing it home." Definitions of a glutton were, "A 'with-rice' eater," or simply as "one who eats alone." These comments highlight the counsels of eating in moderation and in company. On the other hand, a full stomach was valued for "home is where one eats one's fill."

262 At maturity, when farm and other tasks were shared as
562 equals, men and women ate almost the same food. The old proscription against animal food for women was somewhat relaxed,
262 but not entirely. To sustain farmers during the seasons of
[220] hard work, however, extra quantities of rice and rice alone,
were considered essential. "With-rice" was pleasant but not so
necessary. Any shift away from a diet of rice as ordinarily
cooked in Bang Chan[1] was construed as a shift either in occupation or in health. For example an eminent citizen who gave
[853] up farming took to eating (3)khaaw (3)tom often. This soupy
rice, a staple dish for infant feeding, had interesting socio-economic connotations. It was served as a light lunch to cooperative farm-workers to be followed at the day's end by a real meal. It was also "delicate" food, suitable for the sick, for city-people, for those who did not toil with their hands and backs. Consequently, when this man ate this "delicate food" more often, he was consciously or unconsciously serving notice on the community that he was not going to do farm work any more, for (3)khaaw (3)tom could not possibly have sustained a farmer's strength. Caustic villagers hinted that he was putting on airs.

262 Among conditions in which some change from the usual
843 diet was found were pregnancy, post parturition and lactation.
846 Relatively few foods were generally considered to be tabooed
under any of these conditions, but many women preferred to limit intake to "safe" foods if there were any possibility that certain foods might cause harm.

[126] Information was obtained from 42 mothers about the food they ate during the post-partum rest period. Two said they ate as usual, but for the remainder, the diet was considerably

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[192] [1] Literally "beautiful rice." For method of cooking, see p. 33.

262 curtailed. About half ate soupy rice rather than rice as
843 usually prepared. All ate fish, but over half ate salted
846 fish only, and about one-fourth ate fresh fish only. Rice and fish were apparently the only foods considered safe by all of these mothers. The only other food eaten by half or more of them was banana of the (4)nam-(4)waa variety, baked bananas being commonly specified. Vegetables, when they were eaten, were usually in (1)kaoaeng (1)liang, a broth made with dried fish, and reputed to be valuable for milk stimulation. In Bang Chan, the inflorescence of banana was commonly used in making this product, but other vegetables were favored by some. When asked what foods they considered good for a woman who had recently borne a child, no mother knew of any such food, but the list of foods mentioned as being bad for the mother during the post-partum rest period included more than a dozen items mentioned from 1 to 4 times each: egg, sweets, beef, vegetables, meat, pork, poultry, fresh fish, sour tasting foods, jackfruit, mangoes, fruits of all kinds, and glutinous rice.

262 Fear of illness from eating incompatible foods after
846 child birth was rather strongly expressed by many informants,
753 even by some who knew of Chinese customs which were different
829 from the ancient Thai customs. Some also knew that foods which were customarily forbidden to the woman who had her child at home in the village, were not forbidden at the government health and maternity center at Minburi.

126 The 45 mothers who were interviewed during lactation,
262 but after work had been resumed, ate more nearly the usual
846 diet than was the case during the post-partum rest period. As in pregnancy, the mothers apparently had no notion of special dietary needs during lactation, but foods considered undesirable during lactation were mentioned 27 times. The list included 12 kinds of food, and four attributes of food, i.e. sour and hot tastes, fermented foods and raw foods. No food was considered harmful by a majority of mothers, the one which occurred most frequently, jackfruit, being mentioned by 8 only of the 45 informants.

262 Reasons were seldom advanced for considering various
753 foods unsuitable for mothers or children. During pregnancy,
853 the hot-tasting foods, i.e. those made with chili, were said by one informant to injure the baby's complexion. When asked at what age a child could have adult food, mothers might say at one or two years, but often specified without giving a reason, that the child could have anything but the hot-tasting foods. A reason given for omitting jackfruit from the diet during lactation was that it would cause diarrhea in the baby. One informant said that if a mother nursing a young baby, 1 or 2 months old, ate fresh vegetables, the baby would have diarrhea. Some informants said the "fragrant banana"[1] caused

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[1] The type of banana most familiar to people in the United States.

262 753 855 constipation in infants, others that it caused diarrhea, whether eaten directly by the infant or by the mother.

The belief that eggs would cause dental caries, and should therefore be omitted from children's diets, was expressed by the mother in a poorly nourished family. The possibility that such ideas arose from unwillingness to spend much money on food for a child has already been noted (see p. 42).

262 753 758 Information on food suitable in illness was obtained only incidentally. The Thai did not appear to have a consistent theory as to the cause of disease (Sharp et al. 1956, p. 489), and residents of Bang Chan did not seem to associate any of their illnesses with contaminated food or water. Choice of food in illness was probably associated in some instances with the idea that the body is composed of the four elements: wind, water, fire and earth, and that sickness results from or is a symptom of imbalance in the proportions or arrangement of these elements. Thus the "fragrant banana" and eggs, because of their "cooling effect," were said to be forbidden in measles. A child who was getting measles was [853] restricted to rice and dried fish. In contrast the small, rather flavorless banana, designated (3)kluaj (4)nam-(4)waa, was said to have "no cooling effect" and was considered an acceptable food in illness, as well as for newborn infants.

262 753 784 In one instance, when a patient had been taken to the hospital with severe diarrhea, a nurse instructed other family members not to eat ices, syrup (see p. 36), or raw vegetables, nor to drink unboiled water. The informant who told us about this offered no reason for these precautions. These foods were simply "forbidden" to the family of a patient with severe diarrhea.

777 824 245 Notions as to what is fortunate or unfortunate may also affect agricultural processes. The many ceremonies associated with culture and use of rice have been mentioned (p. 42). The idea that a papaya tree growing near the house was "unlucky" was attributed to Thai by a young Thai Moslem in Bang Chan. When we commented on the papaya tree near his front door, he said the papaya tree dies easily and does not like water, but his was planted on high ground. According to this informant few villagers would be willing to grow papaya trees near the house. He considered the non-specific threat of harm as unreasonable, though he said that if specific harm were said to [777] result, he would be concerned about it. The midwife at Minburi Health Center said that she urged each woman who came there for delivery to have more banana, mango and papaya trees planted for home use. Before raising of papayas can be successfully encouraged, however, the idea that papaya trees bring back luck must be overcome.

FOOD IN CONNECTION WITH FESTIVITIES AND CEREMONIES

262 A discussion of food habits in Bang Chan would be in-
796 complete without some description of ceremonies ((1)ngaan)[1]
which dominate the village scene during the dry, post-harvest
season. These events are of interest in connection with food
habits because of 1) the prominent place that food occupies
in them, 2) the cultural significance and relatively large
cost, both of which must be taken into account in any plans
for dietary improvement and 3) the possible influence of
differences in food habits at the ceremonial season and of
problems of sanitation incident to large-scale food prepara-
tion on the nutrition and health of village residents.

796 The season for ceremonies and festivities opened with
the harvest rites to the Rice Goddess and closed with the be-
ginning of Buddhist Lent in mid-July. The big occasions were
cremations, ordinations into the Buddhist priesthood, weddings,
and rites for cutting of the topknot[2] or homage-to-the-
527 teacher.[3] Smaller family celebrations might mark such events
as the raising and dedicating of a house, the return of a son
from the army, or even public events such as the completion
264 of a road or a bridge. Whatever the focal activity, a gala
meal was served first to priests and then to guests.

[782] Offering food to priests brought merit, which ensured
happiness in later rebirths (see p. 9). Because the greater
the number of priests served, the greater the merit, people
were spurred to put on as large an affair as they could
[554] afford. Moreover, a person was judged throughout the commun-
ity by the abundance and quality of the food served daily and
at festivities. Thus, there was reason to make a (1)ngaan
527 796 as opulent as possible, but celebrations of every degree
occurred in Bang Chan, from lavish feasts to simple cere-
monies.

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[796] [461] [1] Significantly the same Thai word is used for work and for ceremony.

[302] [881] [855] [2] Topknots, formerly worn by all Thai children, used to be cut ritually at the time of puberty. In Bang Chan, the growing of a topknot had become primarily an attempt to improve a child's health. Few school age children wore topknots. They were usually cut earlier than puberty.

[875] [3] A person who had received specialized knowledge from a teacher gave thanks annually in a ceremony, to which those who had profited by this knowledge were obliged to come and/or contribute. Thus, all the patients of a traditional medical practitioner helped him to honor his teacher.

796 The actual ritual of these ceremonies did not take a
great deal of time although it was important. Most of the
[476] time and effort went into preparing and serving food. Even a
small celebration involved cooperative effort among relatives
[782] and friends. For every event, the Buddhist altar in the home
was decorated and offerings were made to the house-spirit. A
764 big cremation might require planning in detail for years ahead:
796 invitations to priests and relatives in distant parts of the
574 country; hiring an orchestra and obtaining ceremonial gear.
[533] For the largest events, when the guest lists ranged upward to
60 or so priests and 400 other guests, one borrowed the hun-
[426] dreds of trays, dishes and bowls owned by the temple. No
rental fee was charged for these, but such items had to be re-
turned the next day, clean, and damaged articles replaced or
paid for. As the day or days drew near, boat-loads of fresh
provender were bought at big markets, and organized cooperative
cooking went on under the direction of a competent person,
[252] usually one of the "professional" cooks of the village. The
[476] day before one ordination, 33 women were seen preparing vege-
tables, fish and soup; 13 others were making 7 kinds of des-
serts; about 50 others of both sexes were at different tasks,
the men in particular cooking Chinese noodles, grating coco-
nut, stirring, stoking fires. The picture was one of rows of
stoves, pots so large they were stirred with a boat paddle,
buckets of sugar, eggs by the hundreds, a hired generator to
run a mechanical coconut-grater. On this occasion two meals
were served. At another splendid (1)ngaan, the priests were
fed three meals, other guests up to eight meals, over a period
of two and one-half days. Workers had received additional
meals beforehand.

[262] The banquet comprised rice and many dishes not met with in daily fare: Chinese noodles; "with-rice" dishes of several kinds, rich in fish, meat and vegetables: for example, fried chicken with internal organs, garlic and pepper; fried pork with mung bean; (2)mii (a fried vermicelli) with fish, vegetables, and a tomato sauce; many different desserts made of eggs, rice flour, glutinous rice, agar, coconut and coconut milk, sugar, sweet potato, dried green beans; flowers served in syrup, fresh fruit such as watermelon; ices and coffee.

128 In Appendix A, p. 102 is a list of foods bought for an
262 annual homage-to-the-teacher rite. It is the nearest approxi-
796 mation to a quantitative record of food for a ceremony that
875 the research group obtained. The prominence of purchased
foods, especially of flesh foods, is noteworthy.

264 On the great day, the priests were served first, either
796 at 7 a.m. or 11 a.m., or both, always at least in part by the
192 host, who sat and chatted with them. No one else ate until

264
796
792 the priests had finished[1]. The trays of food from which each
[264] guest served himself were bountiful, but it was not proper to
796 eat very heartily, lest the host suffer the shame of running
[536] out of food. If there were a dramatic show or movie at night
it was open to the public. In one case 2000 people attended.
[443] At that time eight commercial venders turned up to sell
coffee, soft drinks, ices and other foods. Venders came to every large ceremony, and were heavily patronized. At the end of a (1)ngaan, the sponsors felt satisfaction and security. Where there was plenty of food to take home, the success was even greater. An earthy compliment was, "the fields were full of feces."

• 262 In addition to the banquet were ceremonial offerings of
796 food to spirits and ritual food sometimes consumed as a
[782] sacrament. For each ceremony, appropriate selections were made from a specific list: a cooked pig's head, or at least a slice of cooked pork; two kinds of sweetmeats, red ((2)kha-(5)nom (3)tom (1)deeseng) and white ((2)kha-(5)nom (3)tom (5)khaaw); a cooked fish, usually (1)plaa (3)chauaun, with its head and tail; a green coconut with its coconut water; a bunch of bananas either of the (3)kluaj (4)nam-(4)waa or (3)kluaj (4)nam varieties; a hard-boiled egg, usually duck; and liquor.[2] Other kinds of sweets, fruit, sugar cane, items
527 for betel chewing, chicken, salt, and rice might appear. As
796 these ceremonies were thought to be auspicious, purifying,
[783] therapeutic and protective, they were most elaborate at the
[751] great (1)tham-(1)khwan (soul-strengthening) ceremony, at
[755] house-raisings and at rites to local guardian spirits. The
[782] necessity of these ceremonies explains why when public struc-
[346] tures were raised, a portion of the public funds were used
000 for a repast. In Bang Chan when donations for a new school

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[1] Other priorities in service might be observed; for example, at a celebration preceding ordination the priest-
[888] candidates were served next. At one small affair, when 11
[554] priests came to a home to conduct a service for a disabled
old man who could not go to the temple, this elder was
[574] served after the priests, then the research group who counted
as visiting dignitaries, and finally the other family members, with the women who prepared the food, and the children, eating last. The general sequence prescribed by etiquette was: priests should be served before anyone else, old before the young, the males before females, persons with high status such as teachers and ceremonialists before low, urban before rural. Those who cooked and served came last of all. When the number of participants was large, guests might be served, as they arrived, over a period of hours.

[2] The presence of meat, fish and alcohol is this ceremonial food reflected non-Buddhist elements in Thai culture, and should not be viewed as a gross violation of Buddhist precepts.

In Bang Chan when donations for a new school
264 building warranted buying the foundation materials, so that
476 volunteer labor was solicited for their installation, some of
346 the money went into food, despite additional donations of
food. This was in no way misappropriation. Helping to cook
was as important as helping to dig the holes.

782 The spirit-offering, or the portions eaten by a participant
864 as a sacrament, were actually tiny bits of each food.
Afterward, the entire lay-out, pork, sweetmeats and all, was
eaten. Because all this was holy food, it was felt to be
especially strengthening, so was usually given to children,
but might be eaten by family members and occasionally, priests.
262 The pork was cut up and eaten with a hot sauce, or put into a
[illegible] "with-rice" dish. It was especially appropriate with liquor.

262 The use of food ritually was not limited to the ceremonial
755 season nor to big events. The same purposes underlay the
852 use of a hard-boiled egg eaten in the ceremony that was designed
to restore a child "sick from temporary loss of its
soul," and in another performed in order to wean a baby.

43 The benefits of a (l)ngaan accrued to every participant
554 down to the last worker and contributor according to the degree
796 of assistance. With status in this and in later lives at
stake, no one hesitated to plunge into debt or even to sell
land. For the sake of economy two different ceremonies might
be performed on the same day, for example a child's topknot
cutting at a daughter's wedding.[1] The saving was in time and
expense for food preparation, but such multiple ceremonies
were performed less often than one might expect.

796 One assistance in the financing was that every invited
476 guest made a contribution, customarily 5 to 10 baht, which
435 helped defray the costs. In 1952, household heads reported
these contributions as totalling from 30 to 1,000 baht, with
an average of 343 for the year (Janlekha, 1955). Of 96 household
heads who provided information on special expenses during
the 5-year period March, 1948 through February, 1953, 36 had
given (l)ngaan with net expenditures (costs minus contributions)
ranging from -10[2] to 15,000 baht. The average net cost
was 4,361 baht (Janlekha, 1955). These figures might represent
a single (l)ngaan or several events.

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[1] Every desired ritual could be carried out at little cost. Thus a priest-candidate whose father was dead, was included in the pre-ordination festivities planned for a friend; and on one occasion five bodies were cremated at the same ceremony, which was sponsored by the kin of one of the deceased.

[2] The -10 meant that contributions exceeded the cost.

435 796 [124] Some information as to the cost in baht of the larger ceremonies held in 1954, and their scale, was obtained from the school teacher's diary. Examples follow:

[792] Ordination: Total cost 8,000, including food 1400, liquor 800. Guests contributed 4000.

[852] Top-knot tonsure: Total cost 1550, including new utensils 550; 6 priests fed; each priest given 12 baht; 12 (2)pin-(1)toos filled to take to the temple; 100 duck eggs donated, and 300 baht received from 30-40 guests.

[764] Cremation[1]: Total cost 40,000[2], including about 10,000 for food; 61 priests fed[3]. About 500 guests contributed 4377.

[875] Homage-to-the-teacher ritual:
A: Total cost 715, including food 565 and liquor 150; 40 tang (800 liters) fish and 3 tang Chinese noodles donated.
B: Total cost, 11,000[4].

[585] Wedding: A: Thai Buddhist: Total cost 5000. Guests gave 2300.
[583] B: Rite of forgiveness after elopement: a meal, with 5 bottles of liquor.
[184] C: Moslem: 2 buffalo slaughtered. 400 guests.

585 262 Arranged marriages could be large merit-making affairs, with a huge procession from one house to the other of twenty-four "pairs" of specified foods, i.e. two bearers each of sugar cane, fruits, sweetmeats and other things. [583] At more modest weddings and the rite of forgiveness for a couple who had eloped, food might differ from the usual fare only by including the three essentials of a wedding: pork, chicken and alcohol.

273 796 443 Increased consumption of alcoholic beverages during the ceremonial season was indicated by the sales of one local

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[1] Cremation was the last of several rites at death. Private 7-day, 30-day and 100-day rites were held, when priests came to the home to chant and to be feasted.

[2] With cooperative assistance from well-situated relatives in Bangkok.

[3] [792] [774] The whole chapter of priests from Wat Bang Chan was always included at cremations, and often others from a distance.

[4] See list of food purchased, Appendix A, pp. 102-103.

Chart 2. (continued)

	No.[1] Records	May	June	July	Aug.[2]	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[2]	Apr.[2]
Fruits[6]													
Banana[7]	129	x	x	x	x	x	x	x	x	x	x̲	x	x
Chico	17						x̲	x					
*Guava	14						x	x		x			
*Jujube	18							x	x	x			
Longan	41			x̲									
*Limes		x	x	x		x	x	x		x			
*Mango	25		x̲								x		x
*Orange	48					x	x̲	x	x				
*Papaya	11			x		x	x	x̲		x			
*Pineapple	63	x̲	x̲	x						x	x		
Rambai	46	x̲		x								x	
Sandorica	18	x	x										
Singharanut	22						x	x	x	x			
*Star gooseberry	28	x̲				x					x		
Source of water[8]													
For drinking:													
Rain		x	x	x	x	x	x	x	x	x	x	x	x
Canal										x	x	x	x
Fishpond		x	x									x	x
For food preparation:													
Canal		x	x	x	x	x	x	x	x	x	x	x	x
Fishpond		x										x	x

6. Good sources of ascorbic acid have been marked with an asterisk.

7. Bananas of the (4)nam-(4)waa variety were most commonly used.

8. Data for households participating in the dietary study.

443 storekeeper: about 800-900 liter bottles per month during
273 the 3 months dry season as compared to about 350 bottles per
796 month during the 9 months of the rice season.

184 Moslems never served liquor at their weddings, crema-
[273] tions, and other auspicious events. Moslem residents occa-
sionally attended Buddhist (l)ngaan in spite of dietary pro-
[262] scriptions that Buddhists did not observe.[1] A medium (spirit-
ualist) commented however that because pig's head was essential for her homage-to-the-teacher rites, some Moslem sick persons preferred to go to the Buddhist temple for treatment. There the priest-practitioner could afford to set up a separate kitchen for his Moslem patients, and so spare them the distress of confronting pork. To one big ordination Moslem guests brought their own food. Buddhists came somewhat more often to Moslem ceremonies.

262 We do not have enough information to appraise the nutri-
574 tional significance of food eaten at ceremonies. Some indi-
476 viduals got a great deal of it, others very little. One must
264 remember that the (l)ngaan was not a public but a private event at home, to which guests came on invitation. Although cremations and the teacher-rites of priest-practitioners were held at the temple, and so had a semi-public character, no one who was not invited presented himself for food. Of the participants, the working group undoubtedly received the most food; they were there the longest time, had regular meals, tastings and snacks throughout the (l)ngaan meal itself. This group comprised the host, co-sponsors and their immediate kin; other relatives and friends who were asked or who volunteered to help. The feeling was, if one were "very fond" of the host, one volunteered to cook. If less close, one was invited as a guest, but made the usual cash donation. Sociable persons combining skill and energy were invited often and volun-
[583] teered often, hence spent many days at ceremonies. Young unmarried men and women were asked and liked to be asked to work, for such occasions offered a great chance for fun and flirting.

114 Different degrees of participation may be estimated
476 from Janlekha's (1955) figures for reported contributions
796 ranging from 30 to 1000 baht in a year. Since a contribution of 5 to 10 baht per (l)ngaan was customary, the villager with the lowest reported contribution probably attended from 3 to 6 ceremonial occasions. Attendance at 100 or more (l)ngaan is unlikely, hence the villager who gave as much as 1000 baht probably made larger contributions per (l)ngaan.

574 What sort of persons or groups in the village were in-
796 vited as guests? Every host's list included his older

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[702] 1. Moslems were said to resist army service because they were afraid they would have to eat pork.

796 574 relatives, his other kin and friends according to bonds of affection and respect. Certain priests of pleasing personalities, wide acquaintance or kinship in the community, or of valued skills, were invited more often than others, as were prominent elders and hamlet headmen. An invitation usually went only to the elder couple in a family. It did not automatically include the children. If married sons or daughters were invited, they were asked separately. Poor individuals were included only in the festivities of their close kinfolk, their immediate neighbors, maybe their own hamlet headman, or persons to whom they were obligated. Unless they were aged, their presence was validated only by hard work. Reciprocity was a factor, for one who could not reciprocate presumably would not be asked, nor would he volunteer. The few who were "anti-social" for whatever personal reason rarely attended.

• 260 574 796 858 Most members of the working group and guests left at home their children of such age as to require watching. Nursing babies might be there, hung in a hammock. Though the children who ran excitedly about seemed numerous, most of them were the children, grandchildren, nieces and nephews of host, co-sponsors and relatives, so could not be excluded.

To sum up, those who shared least in the diet of the ceremonial season were the dependent children, i.e. up to the age of 6 or so, the less gregarious, and the poor who had no way to reciprocate. Children from 7 to adolescence shared in a limited way, attending (l)ngaan of their own close kin or of a geographically close neighbor. Parents sometimes took snacks from the feast home to the children. On the other hand, persons of prestige and popularity, especially if aged, were asked frequently.

262 796 Doubtless for those who attended many (l)ngaan, the food eaten during the ceremonial season differed considerably from the usual family fare. We have no way of knowing whether it was better than usual because of a larger intake, for instance, of pork and meat in general, or whether the total nutritive value was less satisfactory because of increased consumption of "empty calories" in the form of sugar and alcohol.

262 264 796 During the (l)ngaan season the home meal schedule was frequently disrupted in the families of the participants. The main cook might be absent, too tired, or too full to feel like cooking a big meal at home. In anticipation of a feast, preparation of the usual breakfast or dinner or both might be abandoned, with reliance on a few snacks for the stay-at-homes to add to their rice. Thus the food intake of family members who did not attend the ceremonials might be adversely affected.

000 One other aspect of (l)ngaan which should be mentioned

One other aspect of (1)ngaan which should be mentioned
252 in connection with food and health is the opportunity for con-
796 tamination of food. The villagers did not associate sanitation
751 with health, hence the hazards of a community meal which many
[753] persons helped to prepare were many. Two incidents observed the day before an ordination in early April, will illustrate. In the final stage of making Chinese noodles, rice flour paste was extruded through a perforated disk into an enormous pot of boiling water. When done, the product was removed with a fish net, and plunged into the canal to cool, after which women helpers spread it out on banana-leaf covered trays. Dishes were also washed before use in the canal, which was then too low for boats. Since, however, many people drank untreated canal water at this season (see p. 28), the added hazards for the participants caused by these procedures may have been slight.

262 In summary, food plays a major role in ceremonies and
792 festivities, which are concentrated in the 3 months' dry season. Proposals for dietary improvement in Bang Chan must take into account not only the possible effects of the (1)ngaan season on the total nutrient intake, and on opportunity for exposure to contaminated food, but also the importance of these affairs from the standpoint of merit and prestige, and the relatively great financial burdens which villagers therefore undertake because of them.

QUANTITATIVE DIETARY STUDY: FOODS EATEN AND ESTIMATED NUTRIENT INTAKE OF SELECTED FAMILIES IN BANG CHAN

Procedure

121 Selection of the Sample
125
146 Medical inspection designed primarily to discover possible signs of nutritional deficiency was carried out in advance of the family dietary study. The suggestion of Grant (1948) that matched groups, of contrasting economic or other status be studied, appeared to be appropriate to the situation in Bang Chan. Our hope was to be able to select from the random sample of families given medical inspection (Hauck, 1956) a group of families (A) in each of which several members had clinical signs which might be evidence of malnutrition, and a group of families similar in age and sex distribution (B) in each of which the members were largely or wholly free from such signs.

125 When the medical inspection of the random sample was
146 complete, however, too few of the families were found to meet our criteria for inclusion in Group A, i.e. the group of apparently less well nourished families. Additional families for

124 On the basis of experience during the pretest, the ob-
125 server began the 24-hour period of observation with an un-
announced visit in the afternoon, in time to see the prepara-
tion for the evening meal. This proved to have several
advantages. A householder whose home had been visited at the
evening meal, and who anticipated the observer's return before
breakfast, could restrain the dog, if necessary; or the home-
maker might postpone washing the rice until the observer
arrived to weigh it. Without such cooperation on the part of
the homemaker, our records would have been much less complete
[408] than they were. Since few village families had clocks, the
time when the homemaker said she would start breakfast was
always approximate.

125 Foods were weighed in both the raw and cooked states,
262 and foods given to priests, fed to animals, left over, etc.
were weighed so that the actual amount eaten by the family
could be calculated. Previously cooked foods included in
the survey meals were weighed and raw weights estimated from
information obtained in other observations. If possible,
snacks were weighed. School children and others who ate
snacks away from home were asked to report them to the obser-
128 ver, and weights were estimated. The guides prepared for
262 the observer are included in Appendix C, pp. 110-111. Data
were recorded on the schedule, shown in Appendix C, pp. 116-120.
and essential information such as the weights of food, after
allowing for weight of containers, was later transferred to
the shorter form shown in Appendix C, p. 121. As examples
some of the data obtained on 3 of the 44 survey days are
shown. Examples of notes on procedures in food preparation
are included with these records. For examples of notes on
the food intake of individuals see Appendix A, p. 97.

Calculation of Nutritive Value of the Diets

Figures from the original records were transferred to the Form for Calculating Raw Weights of Foods Eaten (Appendix C, p. 121), and the edible portion of each raw ingredient consumed was calculated by adjusting the gross amounts according to the use made of the cooked food and the number of family members present. Procedures followed are outlined in Appendix C, pp. 113-115.[1]

Few analyses of Thai foods had been made in Thai laboratories, and most of these were for proximate composition only. Therefore, data from other available sources were used. Since Handbook No. 34 of the United States Department of Agriculture "Composition of Foods Used in Far Eastern Countries" (Leung

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[114] [1] Many of the calculations were checked by Mrs. Mary Barkley Campbell, who made independent use of the data.

128 et al. 1952) included more of the foods used than any other
262 table, it was used as the primary source of information.
Other food value tables (p. 92) were used to supplement it. When two or more values were found for a given food, the more suitable one was selected on the basis of the nature of the food and the method of preparation for sampling, i.e. whether this method was similar to procedures used in Bang Chan. While this study was in progress Tables Showing Food Values for Calculation of Diet Records compiled by the Food and Drug Division, Department of Health (1953) and intended for use in Thailand, were published. These tables, however, included few analyses made in Thailand, and references were not given to the sources from which the values were compiled. For these reasons, the Thai table was used as a supplement only when values could not be found elsewhere.

For convenience in calculation, a table was compiled which contained the most appropriate values available for all items of food eaten on the survey days (Sudsaneh, Campbell and Hauck, 1954). A list of foods for which no nutritive values were calculated, for lack of available information, is given in Appendix C, p. 124. Foods for which values were found elsewhere than in tables, or for which values were imputed by the authors, are listed in Appendix C, pp. 124-125.

Although values for coconut milk were found, they did not seem to be appropriate for the product as prepared in Bang Chan. Coconut milk, (4)naam (2)ka-(4)thi, is a product made at home from fresh coconuts, and used frequently in preparing curries and other dishes. Families in Group A used considerably more water in proportion to coconut meat in making coconut milk than families in Group B, hence a single set of figures was not appropriate for both groups. Since "expressed coconut milk" which had been analyzed in Hawaii (Hawaii Agr. Expt. Sta. Bull. 77, 1936) appeared to be similar to coconut cream, (5)hua (2)ka-(4)thi, as prepared in the village, the composition of coconut milk was estimated by assuming it to contain carbohydrate, protein and fat in the same proportions as "expressed coconut milk" but to be more dilute (Appendix C, pp. 128-129)

Division of food into various food groups, and foods included in each, is shown in Appendix C, p. 126. For each survey day, the adjusted consumption of like foods was added together and the calculated total intake of each food item for each household during one 24-hour period was transferred to the Form for Calculating Nutrients in Foods Eaten. The nutrient content was then calculated. Two such calculations are shown (Appendix C, p. 122). Nutrients available[1] per capita

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[1] Figures used were for the edible portion of raw food, or the food as used in food preparation, i.e. dry salted radish, shrimp paste, etc., with no allowance for cooking losses.

128 per day were calculated for Groups A and B by Round and for
262 all survey days (24 days for 6 families in Group A, 20 for
5 families in Group B). The total amounts eaten per capita
per day, of various food groups, and the relative nutrient
contributions of these groups were also calculated.

Results and Discussion

Socio-Economic Situation of the Two Groups of Families Studied

124 General Socio-Economic Conditions. - In the course of
the study the observers were able to obtain information, both
by inquiry and direct observation, on the economic condition
of the families. Questions about land holdings, the amount
of land farmed, number of working buffaloes owned, number of
priests to whom food was given and sources of income, were
asked during the second Round of the survey, after the participants
were acquainted with both the field workers and the
procedures. As raw foods were weighed, the observer asked if
they were home grown or prepared, and recorded the cost of
foods purchased.

125
146 Although our sample was not stratified with respect to
184 economic condition, the families in Group B, i.e. those
chosen for apparently better nutriture, proved to be more
[434] prosperous than those in Group A (Table 8). With the exception
of Household 222 in Group A, rice production was the
[433] main source of income. Families in Group B had a greater
capital investment in land and buffalo, and worked more land,
having more productive hands per family available. Farm work
was finished sooner, hence members could begin intensive
[859] fishing earlier than in Group A. All children aged 13-15, in
both groups, did light farm work and/or selling in market,
cooking, baby tending and care of buffalo. In all households,
husband or wife or both came from old families in the community,
hence had extensive kinship relations.

125 From the viewpoint of parents, the "peak of life" was
511 the time when children were no longer dependent, but productive,
592 unmarried workers whose earnings stayed within the
434 family. Household 16 was such a family, forward looking,
463 progressive and optimistic. The successful and respected
couple in Household 25 would enter this "peak of life" situation
in a few years. Household 20 included a widower and his
almost grown daughter living with his younger brother and the
latter's family, and their senile mother, in harmonious
cooperation. Ample land, housing, buffalo and farm labor
combined with other skills, made for good living. In Household
21, two strong, unmarried sons still lived with their
elderly parents. The only poor family, of low status, in
Group B, was Household 23. By great industry, especially in

[Text continues on page 63 --- Analyst]

125 fishing and selling vegetables, they managed to obtain a fair
592 diet. The father's skill as a masseur was valued especially
511 at periods of heavy farm work, after childbirth, and by the
434 cooks at a ceremonial feast. This brought in from 2 to 12
463 baht per week.
[262]

In Group A, Families 67 and 103 were at the most difficult period of life, with young, dependent children, and
[235] housing, land and equipment to be acquired. By great industry, including egg production from a flock of 60 chickens, and by severe "belt-tightening," Household 103 was lifting itself into a propertied position. The parents in Household
[857] 67 were shy. One or the other of the two older children
[591] often stayed home from school to look after the baby, so
[124] that both parents could work. Husband and wife in Household 12 were both very shy, the only ones in the survey group who
[152] were at all reluctant to participate. They seemed ashamed of limited food. The wife was frequently ill. In Household
[443] 222, the 14-year old daughter often gathered and sold vege-
[889] tables at Minburi before school in the morning. She might have full charge of the younger children for days at a time. A daughter who worked as a servant in Bangkok contributed 50 baht per month to this household. In Household 215, the
[465] activities of the wife as medium were predominant. Pay included food, often cooked, and the free use of 3½ rai of land, as well as cash. Maintenance of a son in school in
[435] Bangkok cost about 1000 baht per year plus 60 tang of rice.
[871] In Household 2, the elderly wife's services as "boss-buyer and cook" at ceremonials, and as marriage go-between did not bring in cash, but gifts, clothing and much participation in feasts.

431 All families in the survey group were Thai Buddhists,
262 and 6 of them offered food to priests more or less regularly.
792 On 17 of the 24 survey days when the observer visited these
[779] households, food was offered. Two of the 5 families that did not customarily give food to priests, did so on one and two survey days, respectively. In one case food was offered to a son who had been recently ordained. Rice was always included in the food offered, and in 3 of the 20 instances observed rice only was given. The weight of cooked rice given by one family in one day ranged from 185 to 1210 grams, with an average of about 600 grams. In 16 instances, some cooked food such as fish or vegetable curry was given with the rice; in one instance fresh pineapple was given.

511 Cash Expenditures for Food. - Mean total, and per
[128] capita daily cash expenditures for food for survey days, are shown, by household in Table 3. (See Table 2, p. 23 for division of food expenditures for Groups A,B) Although cash expenditures for food varied considerably, the amounts in all cases were small, and approximated figures obtained by Janlekha (1955) for 106 households. Larger consumption of animal products, which were the most expensive items purchased,

511 appeared to account in large part for the greater cash expenditures of some families than others. Thus Household 25, with the highest total and per capita cash expenditure for food among these 11 families, consumed a larger quantity of meat than others, and often bought beef, which was the most expensive item purchased. This household bought fruit, meat, [554] and vegetables from venders almost every day. They said [222] "Some do not pay money to buy food, but pick or get it from the canal or gardens —this family cannot live like that because they come from a rich family and cannot live on poor food, so most of the money goes for food." The husband said "I cannot work on poor food." In Group A, Household 12, which had the highest per capita food expenditure, had little home produced food. The wife, who went to Bangkok often, usually bought food when in town. Household 2, with a total cash expenditure for food higher than others, did not have pork or beef on survey days, but ate more (1)plaa (1)thuu, a sea fish which is purchased.

433 511 Home Production of Food. - In keeping with the general pattern in the community, the families surveyed produced most of their own food.

243 Rice. - The hired laborer received rice as part of his [465] pay, but all other families produced their own. Seven households used polished rice exclusively (Table 9). The only one 256 to use home pounded rice in major part was Household 103. [262] This family lived near a little canal which was dry in summer, so they were using home pounded rice when visited toward the end of March and in mid-July (Rounds IV and I). When the observer came in January (Round III), transportation of rice to the mill by boat was possible, but the family members had little farm work to do and were willing to spend some time milling rice. This family, which lived in the home-milling area (see p. 40), took rice to be milled only during the harvest season when they were busy, and the level of the canal was still high. The families which used home pounded rice in minor part did not live in the home-milling area, and apparently milled rice at home only when they were unable to get to the mill by boat.

244 Fruits and vegetables. - Although the Thai government [654] has attempted to encourage kitchen gardening, few vegetables and fruits were produced by the families which cooperated in [245] the dietary study (Table 10). All families grew bananas, and certain common ingredients of curries: chilies, bergamot, galangal and lemongrass. No other plants were grown by as many as half of the families studied.

222 262 Of the edible plants which grew wild, swamp cabbage was used by 7 families on 11 of the 44 survey days. Bamboo shoots, the white flowers of the West Indian pea tree and yellow (2)sa-(5)noo flowers were used by 3 families on one day each;

256 Table 9. Use of Home-milled and Polished Rice by Households
262 Participating in the Dietary Study

Group and Code No.	Round of Dietary Study[1]							
	I		II		III		IV	
	HM[2]	P[2]	HM	P	HM	P	HM	P
Group A								
2		x		x		x		x
12		x		x		x		x
67	x			x		x		x
103	x		x			x	x	
215		x		x		x		x
222		x		x		x		x
Total No.	2	4	1	5	0	6	1	5
Group B								
16	x		x			x		x
20		x		x		x		x
21		x		x		x		x
23		x		x		x		x
25	x			x		x		x
Total No.	2	3	1	4	0	5	0	5

1. For dates, see Table 7, p. 58.

2. HM and P stand for home-milled and polished rice respectively.

222 truffles were used as snacks on 2 occasions, and (1) bauaun,
262 (2)phag (2)tob, lotus stems and lotus seeds, the latter as a snack, were used once each. The two groups of families appeared to grow fruits and vegetables and to gather edible wild plants to about the same extent. Two families, one in
244 each group, raised mushrooms during the period when farm work was slack.

146 164 absent, and in 6 of these, ankle jerk was absent also. In Group B, the apparently better nourished group, one adult and two school boys had knee jerk only absent. In Group A, Household 12, the father, mother and 21 year old son all had both knee jerk and ankle jerk absent. The son was diagnosed by the examining physician as having frank beriberi at the time of the medical inspection. In Household 2, the father and 23 year old son had both knee jerk and ankle jerk absent, but the mother had no signs of thiamine deficiency. In Household 67, mother and father had both knee jerk and ankle jerk absent. The mother had lost 3 of her 6 children when they were 3 or 4 months old, with symptoms such as convulsions and voiceless crying, suggestive of infantile beriberi. When the third child died, the mother had symptoms of beriberi, and the physician who conducted the medical inspection considered the death of this child to be due to infantile beriberi. Clearly the thiamine content of diets of some of the families studied was inadequate to meet their needs under varying conditions of activity and stress. Beriberi was the one frank deficiency disease observed while these studies were underway in Bang Chan (Hauck, 1956).

146 Fat provided only about 9 to 10% of the calories. Coconut oil contains only about 0.5% of linoleic acid (Anantakrishnan, et al., 1949), but the essential fatty acid content of the diet as a whole was not estimated.

146 164 In summary, although the estimated nutrient intakes of Group B were in general more favorable than those of Group A, the contrast between the two groups was not striking. Perhaps we should have anticipated this from the fact that the groups did not present a clear contrast in apparent nutriture. In Group A, 19 of the 30 persons examined had a total of 36 possible signs of nutritional deficiency. In Group B, 8 persons had a total of 9 such signs. Judging by both the apparent nutriture of the household members, and by their estimated nutrient intakes, the diets of both groups were in need of improvement.

146 Contribution of Food Groups and Certain Common Foods to the Nutritive Values of the Diets

[128] *Contribution of Food Groups and Individual Foods*. - The percentages of the total calorie and nutrient intakes provided by various food groups for households in Group A and B are shown in Table 12.

146 262 Rice and other cereals. - Rice was the staple food, which provided over 4/5 of the calorie intake and more than half of the protein for both groups. Much of the difference in calorie and protein intake of the two groups was due to the greater rice consumption of Group B. Rice was also the

[Text continues on page 72--- Analyst]

Table 12. Percentage[1] of Total Caloric and Nutrient Intakes Provided by Each Food Group

Food Group	Family group[2]	Calories	Protein	Fat	Carbohydrate	Minerals			Vitamins				
						Ca	P	Fe	A	B1	Ribo.	Niacin	C
Rice and other cereal	A	85	57	23	92	23	75	52	1	82	38	66	-
Home-milled rice		20	14	7	21	8	24	16	-	26	13	25	-
All other		65	43	16	71	15	51	36	-	56	25	41	-
	B	82	54	16	93	16	75	46	-	84	51	64	-
Home-milled rice		9	6	2	10	3	12	7	-	14	9	13	-
All other		73	48	14	83	13	63	39	-	70	42	51	-
Fish and other animal foods	A	7	37	40	-	34	18	15	4	7	21	28	-
	B	7	40	29	-	43	19	15	10	8	29	29	-
Green and leafy vegetables	A	1	2	1	-	14	1	8	79	2	31	1	25
	B	1	2	1	1	23	1	17	76	2	10	2	38
Other vegetables	A	3	3	3	3	15	5	13	15	7	8	3	58
	B	2	3	4	2	8	4	7	5	5	8	4	37
Coconut and products (other than oil)	A	2	1	18	1	-	-	-	-	-	-	-	-
	B	3	1	21	1	-	-	-	-	-	-	-	-
Fruit	A	1	-	1	1	3	1	2	2	2	2	1	17
	B	-	-	-	-	2	1	1	9	1	2	-	23
Fats and oils	A	1	-	14	-	-	-	-	-	-	-	-	-
	B	3	-	29	-	-	-	-	-	-	-	-	-
Sugar	A	1	-	-	2	4	-	9	-	-	-	1	-
	B	2	-	-	3	4	-	14	-	-	-	1	-
Miscellaneous and spices	A	-	-	-	1	7	-	1	-	-	-	-	-
	B	-	-	-	-	4	-	-	-	-	-	-	-

1. Figures rounded to nearest whole number. The dash indicates value less than 0.5%. Analyses for a number of common foods were incomplete (see Table 13, p. 75).

2. Group A included apparently less well nourished families, Group B, apparently better nourished families.

146 most significant source of phosphorus, iron, thiamine, ribo-
262 flavin and niacin in these diets. Although the calcium content of rice is low[1], about 23 and 16% of the estimated calcium content[2] of diets of Groups A and B respectively came from the cereal groups. Glutinous rice and various products such as noodles made of rice flour were eaten occasionally in small amounts. These and other cereals and cereal products, such as wheat bread and popcorn contributed little to the total nutritive value of the diets.

Animal products other than pork fat. - Fish and other foods of animal origin furnished about 2/5 of the protein in the diets of both groups. From 20 to 30% of the riboflavin and niacin and substantial amounts of phosphorus and iron were provided by this food group, also. For families in Group A, these animal products provided substantially more fat than the group of fats and oils as such, whereas Group B obtained about the same amount of fat from these two food groups. The estimated contribution of vitamin A from this group was small. Specific analyses for most of the varieties of fish used in Bang Chan were not available, however, hence many calculations were made on the basis of average values for "fat fish," "lean fish," and "dried fish."

Although a substantial part of the calculated calcium content of the diets came from animal products, the amounts were only about 8 and 9% of the estimated allowances for Groups A and B respectively. Fermented fish are reported to contain 1126 mg. per cent of calcium (Knudson, 1955) but the amounts eaten were relatively small. Two families only in Group A used a total of 217 grams of fermented fish on survey days, and two families in Group B used a total of 608 grams. These amounts, though they represented servings of only 20 grams per person for the two families in Group A, and of 36 grams per person for those in Group B, nevertheless increased the estimated average calcium intakes substantially, so that 43% of the calcium in diets of Group A, and 34% in diets of Group B, were provided by animal products. The tiny dried fish which are eaten whole, were not used by the families studied on any of the 44 survey days.

On the average, the contribution of animal products other than fish to the nutrient content of these diets was small.

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[256] 1. According to Knudson (1955), addition of calcium carbonate to rice during the milling process was not practiced in Thailand.

[276] 2. No attempt was made to estimate calcium intake from betel chewing, although this might be considered a dietary source of calcium. Six of 15 persons twenty years of age or older, in Group A, were betel chewers, whereas among 14 persons over twenty in Group B, 9 chewed betel regularly and one occasionally.

146 262 Eggs were eaten occasionally; pork and beef were bought infrequently and in small amounts by some families. One family only, ate chicken; other meats eaten on survey days included buffalo, frogs, eels and field rats.

Vegetables. - More than three quarters of the estimated vitamin A value of these diets was provided by green and leafy vegetables, although the pale yellow sweet potatoes, eaten in quantity by one family in Group A increased the vitamin A from other vegetables substantially. The greater use of swamp cabbage, a wild aquatic plant by families in Group A, may be explained by the fact that more visits to this group occurred when the water level in the canals was relatively high. Families in Group B, however, used a greater variety [263 of greens, especially leaves from a number of trees. For families in Group A, sweet basil contributed substantially to the vitamin A and riboflavin content of the diets, whereas families in Group B used this herb in trivial amounts for flavoring. No nutrient values were found for lemongrass, which was used regularly in substantial amounts for flavoring. Persons in Group B got a greater percentage of their calcium and iron from green than from other vegetables, whereas those in Group A obtained as much or more of these nutrients from other vegetables.

Nearly 3/5 of the ascorbic acid intake of Group A was provided by other vegetables as compared to 1/4 from green vegetables, whereas Group B obtained about equal amounts of ascorbic acid from green and other vegetables. Egg plants[1], calabash and white radish were most commonly used in quantity. Onion, garlic and dried chilies were used daily, but in smaller amounts. With the exception of one family which ate a large amount of sweet potato on one survey day, consumption of tubers, i.e. sweet potato and taro, was small and usually in the form of snacks eaten by children. Legumes were seldom eaten in Bang Chan. Two families had bean sprouts on survey days, and children occasionally ate mungbeans and peanuts as snacks.

Fruit. - Although technically a fruit, the coconut does not resemble fruits as a group in its contributions to the diet, hence coconut and other fruits are treated here as two sub-groups. Coconut meat, and its products, coconut milk and coconut cream (Appendix C, p.128), were used almost daily in the participating households. These coconut products contributed about 1/5 of the total fat of the diet, for Group A,

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[244] [252] [1] Many varieties of eggplant are grown in Thailand. Three were used on survey days: the pea-size variety which was frequently put in hot curry, a round type which was served raw with chili sauce and a long variety which was either panned with a small amount of fat or used in curry.

146 more than fats and oils as such.

• 262

Bananas were grown by all families that participated in
the study, but were eaten only occasionally, primarily as
[263] snacks. Tamarind and lime were used often in small amounts in
making sour curry and chili sauce, and bergamot rind was used
for seasoning. Papaya and mango, both of which are good
sources of vitamin A and C, were each eaten once only during
the survey. The green papaya was used in curry. Fruits are
relatively abundant in Thailand, the year round, yet fruit
made minor contributions to the diets of families studied in
Bang Chan.

Fats and oils. - Fats were used in small amounts to pan fish, meat, eggs and vegetables, and provided about 1/7 of the total fat in the diet of Group A, and 2/7 for Group B. Coconut oil, which was less expensive than pork fat, was more often used in Group A.

Sugar. - Palm sugar was used in small amounts in the preparation of many "with-rice" dishes, and occasionally in snacks, i.e. guava dipped in a mixture of sugar, salt, chili, mung beans cooked in palm syrup and the like. The amounts used were small, and the contribution to nutritive value was slight. By Western standards, the consumption of sugar in Bang Chan was almost negligible.

146
263 Spices. - Spices were commonly used in food preparation, particularly in hot dishes (i.e. those made with chilies) but little information on their nutritive value is available.

146
273 Alcoholic beverages. - In the families surveyed, all men except the elderly father in Household 21 drank occasionally, but most of the women did not. The husbands in Households 12 and 67 drank heavily at times. No estimate can be made of the contribution of alcoholic beverages to caloric intake in these households.

146 Summary of Nutrient Contributions of Foods Commonly
262 Eaten in Two Groups of Households. - The contribution in terms
[128] of calories and nutrients of certain foods used by 25% or more
of the families studied, i.e. by 3 or more of the families on
at least one survey day is shown in Table 13. Items selected
for inclusion in this table are those which either made significant contributions to the nutrient content of the diets of Groups A and B respectively, or were major items in terms of amounts used or frequency of use. For certain items used frequently for seasoning, information on nutritive value was too scant to warrant inclusion in this table. Figures given are for average consumption per capita per day, based on all persons in the specified groups, and all survey days. For items used by all or most families every day, such as rice, fresh fish, chili, coconut products, and sugar, the figures represent approximately the usual daily per capita consumption.

Table 13. Contributions in Terms of Calories and Nutrients of Selected Foods Commonly[1] Eaten by Groups A and B

Foods	Frequency[1] of Use	Average values per person per day												
		Wt.	Calories	Protein	Fat	Carbohydrates	Ca	P	Fe	Vit. A	B_1	Ribo.	Niacin	Vit. C
		gm		gm	gm	gm	mg	mg	mg	I.U.	mg	mg	mg	mg
Group A														
Rice		399	1440	28	3	316	28	634	3.5	(0)[2]	0.54	0.14	7.5	(0)
Eggs	9	4	8	1	1	0	3	8	0.1	48	0.01	0.01	0	0[2]
Fish, fresh	31	57	58	10	2	0	19	124	0.6	0	0.03	0.04	2.4	0
Fish, dried	8	6	12	3	0	0	4	[2]	0.2	0	0	0.02	0.2	0
Fish, fermented	2	2	2	0	0		19			0	0	0.01	0	
Fishsoy		5	2	0	0					0	0	0	0.1	
Shrimp paste	33	3	3	1	0					0	0	0	0.2	
Swamp cabbage	4	20	3	0	0	1	9	6	0.3	750	0.01	0.01	0.1	4
(2)Phag (2)ka-(2)cheed	4	3	1	0	0		6		0.1	204	0	0.01	0	2
Sweet basil		4	4	0	0	1	3	2	0.1	504		0.09		0
Calabash	3	11	2	0	0	0	1	2	0.1	8	0	0.01	0.1	1
Chili, fresh	17	4	1	0	0	0	0		0	126	0	0	0	8
Eggplants	10	13	3	0	0	1	2	5	0.1	4	0.01	0.01	0.1	1
Radish, white	5	7	2	0	0	0	0	6	0	1	0	0	0	1
Sweet potato	1	18	22	0	0	5	5	9	0.1	74	0.02	0.01	0.1	4
Banana	2	3	3	0	0	1	0	1	0	14	0	0	0	0
Coconut milk[3]	22	144	30	0	2	2								
Coconut oil		2	15	0	2	0	0	0	0	0	0	0	0	0
Lard		-	4	0	0	0	0	0	0	0	0	0	0	0
Sugar, palm		6	22	0	0	5	5	2	0.6	0			0	
Total			1637	43	10	332	104	799	5.8	1733	0.62	0.36	10.8	21
Total from all foods			1731	50	14	342	129	847	6.9	2047	0.68	0.37	11.3	27

See footnotes p. 76.

Table 13, cont.

Foods	Frequency[1] of Use	Wt.	Calories	Protein	Fat	Carbohydrates	Ca	P	Fe	Vit. A	B_1	Ribo.	Niacin.	Vit. C
		gm		gm	gm	gm	mg	mg	mg	I.U.	mg	mg	mg	mg
Group B														
Rice		438	1579	30	3	345	29	654	3.7	(0)	0.56	0.15	7.4	(0)
Glutinous rice		8	30	1	0	7	1	12	0.1	(0)	0.01	-	-	(0)
Eggs	7	5	9	1	1	0	3	10	0.1	58	0.01	0.01	0	0
Fish, fresh	32	72	75	13	2	0	25	158	0.7	0	0.04	0.05	3.0	0
Fish, dried	10	12	22	5	0	0	7		0.3	0	0.01	0.03	0.5	0
Fish, fermented	2	4	5	1	0		46			0	0	0.01	0	
Fishsoy		3	2	0	0					0	0	0	0.1	
Shrimp paste	28	2	3	1	0					0	0	0	0.1	
Swamp cabbage	5	9	2	0	-	1	6	4	0.2	542	0.01	0.01	0.1	3
(2)Phag (2)ka-(2)cheed	2	3	1	0	0	0	6		0.1	198	0	0.01	0	2
Calabash	1	10	2	0	0	0	1	2	0.1	7	0	0.01	0.1	1
Chili, fresh	8	3	0	0	0	0	0		0	48	0	0	0	6
Eggplants	3	5	1	0	0	0	1	2	0	2	0	0	0	0
Radish, white	2	12	3	0	0	0	4	3	0.1	3	0	0	0	2
Coconut milk[3]	16	76	52	1	4	3								
Coconut oil		3	27	0	3	0	0	0	0	0	0	0	0	0
Lard		3	30	0	3	0	0	0	0	0	0	0	0	0
Sugar, palm		11	43	0	0	11	9	4	1.3	0			0.1	
Total			1886	53	16	367	138	849	6.7	858	0.64	0.28	11.4	14
Total from all foods			2009	59	22	384	194	895	8.4	1340	0.76	0.28	11.5	23

1. All items were eaten by 25% or more of the participating families. Under "frequency of use," the number of times the item was used as a main ingredient of a "with-rice" dish is indicated for 24 survey days for Group A and 20 survey days for Group B.
2. ( ) means imputed value; 0 means none or insignificant amount; - means no values available, but probably contains measurable amount; blank space means that no information was found.
3. Different values were used for the calculation of nutrient content of coconut milk for Groups A and B (see Appendix C, pp. 128-129).

146 262 For items used less frequently, the figures are correspondingly less than the usual amount eaten. Thus, sweet potato, which is represented as 18 grams per day per person in Group A, actually appeared on 3 records only. One family of 8 persons ate 1200 grams of sweet potato at one meal and a substantial amount later the same day. Most items appear on the lists for both groups, but sweet potato, sweet basil and bananas were included on the list for Group A only, and glutinous rice which is used as a sweet in this area, appears on the list for Group B only. Note that a few common foods account for most of the nutrients in the diets of both groups. These common foods account for only about 80% of the calcium and vitamin A value and slightly less of the ascorbic acid in the diets of Group A. The list for Group B accounts for about 70% of the calcium and 60% of the ascorbic acid in the diets of this group. The variety of green leaves used once or twice only on survey days by Group B, and the number of different seasonal fruits used by both groups in small amounts as snacks, probably account for this.

264 [855] 262 Contribution of Snacks to the Nutrient Content of Diets. - On the average, 4 out of 5 children had one snack per day, whereas only one adult in 6 did so. The following items appeared most commonly: various kinds of fruit, 40 times (orange 7, banana 6, pineapple, watermelon and mango each 5 times, guava, jujube and Manila tamarind each 2 times, olives, rambutan, rambai, star gooseberry, (2)ta-(1)koo and Thai nutmeg each once,) coconut and bread each 13 times, glutinous rice 8, mung bean 7, truffles 6, products made of rice flour 6 times, and a variety of other items including rice noodles, sweet potato, taro, bean sprouts, lotus stalks, lotus seeds, popcorn, products made of cassava flour, sugar cane, pork and milk from 1 to 4 times each. Salt, and/or palm sugar were [146] eaten with a number of the snacks. Although they contributed only about 2% of the total calories, and from 1 to 3% of most nutrients, snacks contributed 16% of the total ascorbic acid for Group A and 11% for Group B.

Seasonal Variation in Food Preparation, Meal Patterns, Food Costs and Calorie and Nutrient Value of Foods Eaten

128 252 264 [435] In Table 14, a summary including the number of meals prepared, time spent in meal preparation, number of "with-rice" dishes, and cash expenditures for food is given by rounds, for families in each group.

252 512 Number of Meals Prepared. - Food was cooked twice on each survey day in 3 of 6 households in Group A and 3 of 5 households in Group B. Heavy farm work or vending which kept the mother away from the house sometimes accounted for once-[443] a-day food preparation. One housewife who took food to market in Bangkok, cooked food twice a day only during the period shortly before the birth of a child, when she was not vending.

[Text continues on page 79 --- Analyst]

252 Another, who had time during Round IV to prepare food twice a
262 day, preferred to prepare more in the morning when she expected
264 to offer food to her son who had just been ordained. In two
512 instances an evening meal was not prepared because the father
[525] and mother had been invited to a feast in connection with an
ordination ceremony, on one occasion a mother did not prepare food because she was gambling. In all of these cases, the evening meal at home consisted of leftover rice and other foods prepared earlier. The housewife in Household 215 sometimes received cooked foods from visitors in return for her services as medium, and these were used, together with leftover foods, for the evening meal. The meal patterns of the two groups of families did not appear to differ greatly.

252 Time for Meal Preparation and Number of Dishes Prepared. - In general, the time for meal preparation varied with the number and type of "with-rice" dishes prepared. The "hot" dishes usually required more preparation time than the mild ones, because of the time required to pound spices, and to cut up ingredients. Once-a-day food preparation reduced the time required for cooking. More time was apt to be spent on food preparation when the housewife was least busy with farm work or other work outside the home. Some of the families visited early in Round I had not begun heavy farm work, and in some, children, who were less skilled, did the cooking.

262 Cost of Food Purchased. - The lowest cash expenditure
435 for food by any household on a survey day was 0.12 baht, for
511 a family in Group A, and the highest 16.24 bahts, for a household in Group B (Table 14, p. 78). On a per capita basis, however, the mean cash expenditure for food by Group A households, for all survey days, was slightly higher than for households in Group B (Table 8, p. 62), and no evidence was obtained that in general households in one group tended to spend more for food than households in the other. Despite the wide variation in cash expenditures for food on the survey days, the tendency for cash expenditures for food to decrease in both groups of households as the survey year pro-
262 gressed was apparent. Most of the rice was sold at the end
432 of Round III. The cash went for capital investments, not
[221] food, during Round IV. With time to drain ponds and to fish intensively, and with ceremonies to attend, people did not need to buy fish and meat which were relatively expensive.

146 Calorie and Nutrient Value of Foods Eaten. - The
221 seasonal variation in calorie and nutrient intake of the two
[228] groups of families is shown in Table 15. As one would expect, the average calorie intake was higher during Rounds I and III, when relatively heavy farm work associated with planting and harvesting was under way, than during Round II, which was primarily the growing season for rice, or Round IV, when the harvest was in, and the earth was dry so that preparation for the next planting had not yet begun. Greater consumption of rice in Rounds I and III was largely responsible for the

[Text continues on page 81 -- Analyst]

000 First steps toward a better diet are suggested by the best dietary practices observed. Although the calculated intake of no family on any survey day approximated or exceeded the estimated allowances for all nutrients, sharp contrasts were evident in individual records. Two sample calculations in Appendix C (pp. 121-122) represent one of the better and 240 332 one of the poorer records obtained. The food for Household 12, on Jan. 14, 1954 consisted chiefly of polished rice, fish, and non-leafy vegetable, with seasonings. In contrast, on July 23, 1953, Household 16 used home-milled rice, and about 60 gm. per person of swamp cabbage, with other vegetables and fish. These choices enhanced the potential nutritive value of the diet markedly without increasing its cash cost. Family labor was involved, however, in gathering greens and milling rice.

000 Since rice is the chief solid food for all ages, improving this major item will be considered first. An important step would be to teach the people to cook rice with just enough water so that all would be absorbed. The Thai government has sought to encourage this. [252] [146] So long as the practice of cooking rice in excess water persists, much of its vitamin and mineral content will be discarded, and efforts to improve the nutrient content of rice will be largely nullified. Some rice water could be used as a beverage, and for cooking certain vegetables which are commonly served with a thickened sauce. This would be preferable to discarding the rice water, but encouraging its use must be considered as an alternative to cooking rice without excess water, since the two practices are mutually exclusive.

[146] [256] Use of under-milled and processed rice, and of the rice polishings, has the advantage that a large part of the original B-complex content is conserved, whereas vitamins for enrichment are at present imported, and are apt to be for years to come. Since home milling persisted to some extent in Bang Chan, it might be encouraged, in some families. [256] [354] One highly respected headman continued to mill rice at home, hence the "prestige value" of white rice may not be so important in Bang Chan as it is among city Thai, who sometimes regard undermilled rice as "prisoner's food." The time and effort involved in home milling, however, may deter those who have given it up from returning to it; and since deepening the main canal has made the mill accessible to more families the year round, a program based on the assumption that commercial milling of rice will increase is probably more realistic than an attempt to encourage the return to home milling where it has been abandoned.

256 At present, no processed rice is made in Thailand. A plan to buy and install a Malekizing plant to process rice for the Royal Thai Navy was announced in 1953, but the plan has not materialized. Enriched rice has been sold by the Thai Rice Company for some years, but the best grades only,

256 90 to 100% unbroken grains, are used. To benefit rice farmers,
enrichment should either be done at the nearby mills,
or premix sold locally, and farmers taught to mix it with
[146] their own rice. Because the premix used and marketed by the
Thai Rice Company contains riboflavin as well as thiamine,
niacin and iron, the treated grains can be readily distinguished
000 from ordinary rice. Enrichment at the mill would be
convenient, but would probably entail some government supervision
and would not automatically ensure a better nutrient
intake unless people learned the value of the conspicuous
yellow grains. From this standpoint, separate purchase of
premix might have advantage, at least in the initial stages
of the program.

As far as we know, use of rice polishings in preparing "with-rice" dishes has not been explored in Thailand. Incorporation of rice polishings into a variety of soups and other "with-rice" dishes which would be acceptable to the Thai palate should not be difficult for the Thai home economist interested in experimental cookery. Nutrients usually lost in milling could thus be returned to the human diet. If adopted this procedure could be effective even in families that cling to the customary method of cooking rice in excess water. One old lady with beriberi, whose doctor had prescribed rice polishings, said she found them tasty. Information on the health value of rice polishings would probably be received more favorably if homemakers were shown acceptable ways of using them. A watery extract of the polishings might be used as a stop-gap preventive of thiamine deficiency while the slow process of changing food habits is going on. Such an extract could be used as a strengthening medicine for women during pregnancy and lactation, for infants and young children, and for those doing heavy field work, i.e. for vulnerable
[758] groups. The "second class doctors" at Minburi, the priests
who practice healing, other traditional practitioners and midwives,
because of their basic desire to help, would provide
natural centers of information for this purpose.

Efforts being made by Thai government agencies to encourage eating more "with-rice" and less rice should be continued. A Thai co-worker suggested that "an educational program enjoining less peppery forms of with-rice would have the effect of encouraging consumption of a larger proportion
[262] of with-rice" (Sharp et al. 1953, p. 278). Various food items
including those with a hot taste, were sometimes said to be
bad for children, pregnant women, sick persons, etc., but seldom
was any food mentioned as being good to eat under these
circumstances. The concept that hot tasting foods are not
healthful might be coupled with the idea that more generous
amounts of mild dishes, especially those including green and
[262] yellow vegetables, should be used instead. The most widely
used vegetables in Bang Chan were the wild swamp cabbage, and
(2)phag (2)ka-(2)cheed, both leafy aquatic plants. Planting
more (2)phag (2)ka-(2)cheed, and liberal use of both of these
plants while they are available should be encouraged.

000 Growing other kinds of green and yellow vegetables
should be fostered. Although vitamin A value and riboflavin
content appear to be critical, in choosing vegetables to be
stressed, specialists in agriculture should consider greens
[262] with high calcium and low oxalic acid content also. A
variety of edible leaves of trees were used by a few families;
some used sweet basil as a vegetable rather than just
a seasoning; pumpkin and sweet potato were familiar, but
less often used than would be desirable. More green or
yellow vegetables which mature when canals are low and
aquatic plants no longer available, would be especially good.
If increased production by most households[1] is not practicable,
a few of the more successful gardeners might be
persuaded to produce vegetables and fruits which would help
to bridge the gap between rainy seasons. Mushrooms, which
can be grown readily, would provide a good source of riboflavin
when leafy vegetables are in short supply. The boom-
[264] and-bust experience in mushroom culture (See Appendix A,
pp. 101-102) might, however, make its revival as a source of
healthful food for home use more difficult than if the
villagers did not think of mushrooms as a cash crop for
which the market failed.

Eating more fruit would help to tide over the dry
262 season. Fruits were commonly used as snacks, not at meal-
[264] time, hence snacks of fruit should be encouraged for adults
as well as children. Bananas grew in all gardens and were
available the year round. The (4)nam (4)waa variety, which
was used in ceremonies, and considered safe for all, should
000 be stressed. More families could grow pineapple, which is
[771] relished both raw and in curries. Mango and papaya, fruits
of outstanding value for both vitamin A and ascorbic acid,
would be excellent, but the idea that growing papayas is
"unlucky" must be taken into account. If a few of the more
thoughtful and forward-looking farmers could be persuaded to
start papaya trees, even though they were not willing to
plant them near the house, the practice might spread in time.

146 On the average, the Bang Chan diet did not seem to be
[164] very deficient in protein, but distribution is not proportional
to need, and protein deficiency may be in part responsible
for periods of weight loss, or failure to gain, so
000 common among infants and children. The presence of other
[134] essential nutrients in animal foods is important also. If,
the local supply of fish is indeed diminishing, efforts to
[224] increase it through pond culture should be continued. Abandonment
of tilapia culture in Bang Chan, after about one-third
of the families had tried it, (Appendix A, p. 101)
suggests that not enough of the right kind of help was given

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[1] Tenant farmers may not be permitted to enlarge gardens by mounding at the expense of rice fields.

000 concerning its culture and use. Tilapia culture was learned
[431] largely by trial and error, and was considered primarily as a
[226] source of extra cash. If it had been regarded also as a means
of improving health through increasing the family's food
supply, and if the homemaker had been shown how to use this
unfamiliar fish in familiar ways, the outcome might have been
[262] different. Increased use of fermented fish and of small dried
fish which are eaten whole, should be encouraged. So long as
the ability of human beings to adapt to such low calcium intakes without harm has not been proved, any feasible means of
increasing the calcium content of the diet seems worth trying.

262 More home consumption of eggs would be desirable, but
[432] their ready sale and acceptability for barter may present an
[431] obstacle to increased home use. Increased production would
probably lead to some increased home use at least at the peak
[432] season. Duck eggs which are less often sold, might be stressed
both for this reason, and because of their greater size. The
idea held by some that eggs are not good for children nor for
pregnant women should be countered when possible. Since hard
cooked eggs have many ceremonial uses, they might be presented
[264] as "strengthening" food. Hard cooked eggs, which could be prepared the night before, would be convenient as breakfast for
workers who would otherwise go to the field without food, for
lunch to be carried to the field or to school, and for occasions when parents are to be away from home, as at a ceremonial,
and should leave food at home for children.

272 Milk, as canned, dried or malted milk preparations, was
792 considered an appropriate gift for the priests, who are forbidden to eat solid food after the 11 a.m. meal. Some of this
789 may be shared with the temple boys. The respected old ladies
and others who stay overnight at the temple on the Buddhist
holy day, and who observe the same rules as the priests for
this time, also like to drink milk, often with coffee. Perhaps
the wat committee could be taught how dried or canned milk
should be reconstituted, and could direct that this be done.
They could both spend some of the cash offerings for milk and
encourage those who buy gifts of food for the priests to in-
000 clude milk among them. People gladly bought food for the
[illegible] priests and would probably accept on the authority of the head
[illegible] priest or respected elders, the idea of buying certain foods
of high nutritive value, even though these cost more. If a
small group of leaders, such as the wat committee or the hamlet headmen were instructed in the dangers of contaminated
water and the values of good food, with the implication that
the best available should be offered the priests both daily,
and on ceremonial occasions, improved practices might spread
to home consumption, since most food is prepared in the home.

[796] The importance of merit making and the relatively large
[782] cash expenditures involved in ceremonials, will probably
influence acceptance of any improved practices which involve
cash outlay. If some leaders were interested in dietary

APPENDIX A

Description of the Kitchen and Some Notes on Food Preparation in a Relatively Prosperous Household[1]

Friday, May 22, 1953

117
[114] Arrived at 5:15 a.m. When we reached the house, the
mother was holding the dog. The house was dark, and we
[189] walked around sleeping babies and children. . . . . The
[252] 15 year old niece who prepares meals here, was already at
[512] work. For light she had an oil lamp, a tin of about 1 pt.
[354] capacity, with wick. The rice was already measured, but she
[124] waited until SS could weigh it, before putting it on to cook.
SS used her flashlight to see the scale and her notebook.

[353] The kitchen here has a thatched roof, well smoked, but
[354] the walls and "windows" are of woven split bamboo. A sliding
wooden "window" can be pushed back to allow access to a
[264] broad shelf outside. Here a large pan of pond water is kept,
so that dishes may be rinsed and hands rinsed after each
[515] operation. Dishes are stacked upside down, on a wooden rack
nearby, to dry.

117
354 The stove area in the corner has place for one fire,
[252] but several places for pots to stand. Downstairs, under the
[illegible] shed near the fish pond, is a larger clay stove, where the
[264] niece cooks the rice in the morning (enough for noon as well)
and some other items; for example the (3)khii-(2)leg leaves
which were cooked last night for use in sour curry this a.m.
This probably keeps the kitchen cooler than it would other-
[356] wise be. Waste, fish bones, vegetable parings, etc., which
are to be given to the chickens, can be thrown below through
the space between two floor levels (kitchen and main rooms).

[231] Rice water, coconut water, and food left in the serving bowls when the meal is over, are given to the dogs. A bowl is kept below, near where rice is drained, for dog food. Food left in pots is kept for humans to eat.

117 Fish caught in the pond are kept alive in pond water,
252 in a water jar. When a fish is wanted, the niece catches
one from the jar, stuns it with the back of her knife, and
scales and cleans it on a split log nearby (rounded side of
log up). The fish is put into a small basket, and the niece

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[1] In reproducing these notes, slight changes have been made such as substitution of descriptive terms for personal names which appeared in the original.

117 takes it down the steps to the fish pond, where she swishes
252 the basket around to wash the fish, and rinses her hands at
the same time.

[291] There are some hazards to the food--chickens trying to
get at the edible part of fish while the niece cleans it (she
leaves the scales, etc. for them to eat); cat and kittens in
the kitchen, having to be driven away from the grated coconut
and coconut milk, and getting an occasional unweighed nip.
Whether we start to weigh food for the evening meal or a.m.
meal, some cooked foods are apt to be used, either left over
● [262] from a previous meal, or cooked in advance. This a.m., for
[126] example, buffalo meat, already cooked (but not weighed before
cooking) was used, and (3)khii-(2)leg leaves, which SS weighed
last night. These latter were cooked last night, to reduce
bitterness, then put into curry today.

Description of Food Preparation Area in a Relatively Poor Household

Wednesday, May 27, 1953

117 Arrived about 5:45 a.m. While other food was being pre-
[262] pared, the 11-year old son came in with a package of salted
white radish and a small milk tin with some coconut oil which
had just been bought. This is the house which we found flooded
when they sent for us to see the baby last fall. The roof
seems to be well thatched. The floor is not wet after last
[352] night's downpour. The bed platform, in one corner, is about
[352] 8 x 10 feet. The baby's cradle hangs above it. In the oppo-
[352] site corner is a shelf where utensils are kept. Some food,
[251] in paper bags, is in a basket hung from the roof. Fresh fish
[359] is kept in a jar of water until needed. The stove is on a
small mound of earth, and further elevated on a small box
(just big enough for the stove) filled with earth.

[352] We sit on a mat, spread on the mud floor, with the
scales, plastic bowls and waxed paper ready for weighing food.
[355] The children lie on a mat nearby. In the house is a fresh
mound of earth, a small straw bin with rice, and various
pieces of equipment.

Notes on Meal Service

In a Relatively Prosperous Household

Friday, May 22, 1953

117 Before breakfast is served, the six-year old girl comes
262 with a piece of jack fruit. SS weighs it and tells her to
bring back what she does not eat. Later she comes with hands
[264] full of stones (14 of them). She has eaten this much as a
"snack" before the regular meal. The grandmother finishes
[126] the piece (7 stones) and gives the rind to SS to weigh.

[264] At breakfast the family sits in a circle on the kitchen
floor. Each person except the baby has his own bowl of rice
before him. In the center of the circle, within reach of
all, are four small dishes of "with-rice" which has been prepared for breakfast: sour curry of buffalo meat, curry of
(3)khii-(2)leg leaves, bean sprouts and one small fried fish.
[853] The mother takes a very small bit of fish on a spoon with
rice, and feeds baby. During breakfast baby has 6 bites of
[553] rice with fish, nine small spoonfuls of rice with sour curry.
The mother herself eats one bite of fish. She takes four spoonfuls of sour curry on plate with rice. This is shared with baby. Mother and baby eat mainly rice, fish and sour curry of buffalo meat, whereas grandmother and the six-year old girl have curry of (3)khii-(2)leg leaves and bean sprouts with their rice.

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[553]

In a Relatively Poor Household

Wednesday, May 27, 1953

While the mother finishes the meal preparation, the seven-year old girl feeds the baby, first rice with some chopped egg, then rice with the "water" from the egg. The mother remarks that she cannot cook unless someone looks after the baby.

117 Technique of eating -- A tray with the "with-rice" is
264 set out, also a bowl with water, for rinsing the hand, and a basin or bowl with drinking water. There are spoons in the "with-rice," but these seem to be used for taking some of the juice, which may be eaten directly or put on the individual's bowl of rice. Solid pieces are taken from the serving dish by hand, and mixed with some of the rice, which is then picked up in the right hand. Occasionally the person eating will rinse his hand with water. When finished, each person rinses his bowl (using either water from the bowl nearby, or from the general supply -- in this case the canal). Dishes are turned upside down on the platform near the stove to dry.

Examples of Notes on Food Eaten by Individuals

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264 Household 16 July 23, 1953

Family members observed at meal-time: All, as they ate breakfast at various times.

Notes re kind and amount of food eaten:

Breakfast: Girl aged 12 and boy aged 7 start eating at 7:20 a.m. Each one has one dish of rice and stew of swamp cabbage and salt fish for breakfast. They are through eating at 7:40 a.m.

9:10-9:30 a.m. Father eats two dishes of rice with stew and mother does also.

10:10-10:20 a.m. Son, 18 yrs. old, returns home and eats two dishes of rice mixed with stew.

10:40-11:00 a.m. Sons aged 25 and 20 have breakfast. The older one eats two dishes of rice but the younger one eats three.

11:30 a.m. Daughter aged 22 has two dishes of rice and stew. She is through eating at 11:45 a.m.

Household 67 May 26, 1953

Family members observed at meal-time: Mother and children.

117
262 Notes re kind and amount of food eaten:

Dinner: Girl aged 7 seems to be fond of fish but dislikes vegetables. Boy aged 11 likes to eat the vegetables from the curry. Each one eats two dishes of rice mixed with small amount of hot curry (5:02-5:17 p.m.)

[853] One year old baby is fed by his older sister, eating two spoonfuls of rice mixed with boiled coconut milk. Whenever he refuses to eat, his mother nurses him.

5:40-5:55 p.m. Mother eats 3 dishes of rice with 2 dishes of hot curry, containing a small amount of fish.

Father begins eating at dark so we can't see him.

Examples of Diet Records Submitted by School Children

Date	Breakfast	Lunch	Dinner	Snack
	Diet Record[1] of 10-year Old Girl: Diet Class I[2]			
May 19, '53	Sour curry of (2)phag (2)ka-(2)cheed Curry of swamp cabbage Boiled vegetables Fried mushrooms Roasted pilot fish Chili sauce		Cooked fish (sour) (2)phag (2)ka-(2)cheed Chili sauce	Star gooseberry Jack fruit seeds Fruit of egg tree Sweet made of flour, sugar, coconut milk Sweet made of flour, sugar, sugar palm
July 7, '53	Curry of (2)phag (2)ka-(2)cheed Boiled swamp cabbage	Boiled fish Boiled fermented fish	Boiled egg Roasted fish	(1)lam-(1)jaj (Fruit of Euphoria longana) Jack fruit seeds Sweet made of flour and sugar
Sept. 13, '53	Cooked climbing perch and other fish (sour)	Fried towel gourd with pork Fried serpent-head	Boiled climbing perch and silurus	Sweet made of flour, sugar and coconut milk Hog plum
Oct. 29, '53	Sour curry of katurai flowers with (2)phag (2)ka-(2)cheed Fried pork with swamp cabbage	Hot curry of serpenthead (2)phag (2)ka-(2)cheed Chili sauce	Sour curry of lotus stalks	Jack fruit seeds Fried banana Jambean

Examples of Diet Records Submitted by School Children (cont.)

Date	Breakfast	Lunch	Dinner	Snack
Nov. 25, '53	Curry of lotus stalks Fried salted fish (2)phag (2)ka-(2)cheed Chili sauce	Curry of swamp cabbage Fried salted fish	Roasted salted fish Curry of (2)phag (2)ka-(2)cheed	Orange Fried banana Sweet made of flour, sugar, coconut and corn Sweet made of flour, sugar, egg and coconut
Jan. 30, '54	Sour curry of (2)phag (2)ka-(2)cheed with katurai flowers	Sour curry of green papaya	Fried sweetened fish	Jack fruit seeds Rice flour chips Sweet made of flour, sugar, coconut, corn
June 4, '54	Fried fermented fish Curry of egg plant Cooked salted pork	Fried egg Salted crabs	Curry of pineapple Curry of chicken Curry of bamboo shoots	Star gooseberry Ice Sweet made of flour, sugar and coconut milk Sweet made of flour, sugar and coconut

Diet Record of 12-year Old Girl: Diet Class III

Date	Breakfast	Lunch	Dinner	Snack
Feb. 14, '53	Hot curry of fish Fried dried meat with sugar		Sour curry of swamp cabbage	Sweet made of rice, banana and coconut milk
July 7, '53	Curry of chicken		Curry of white gourd	Longan

Examples of Diet Records Submitted by School Children (cont.)

Date	Breakfast	Lunch	Dinner	Snack
Sept. 13, '53	Curry of (3)khii-(2)leg		Curry of chicken	Fried sweet potato Star gooseberry Hog plum
Oct. -- '53	Sour curry of green papaya Fried swamp cabbage		Hot curry of fish	Guava Sweet made of dried beans and sugar
Nov. 28, '53	Fried Chinese noodles Boiled vegetables Chili sauce		Fried fish Boiled vegetables Chili sauce	Fried banana Fried Chinese noodles Sweet made of rice, banana and coconut milk
Jan. 30, '54	Beef curry		Sour curry of swamp cabbage	Chinese cake Jujube Sweet made of flour, sugar, coconut and corn Sweet made of dried beans and sugar

1. "With-rice" dishes only are listed for breakfast, lunch and dinner.

2. Adapted from Thorangkul (1957).

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cent of the respondents report that they have engaged in this activity). Even if no mushrooms have ever been grown in a given household, it is still likely that the individuals in it are aware of the practice and have observed it closely through the mushroom growing activities of their friends, relatives, and neighbors (reported in 43 per cent of the households). Only a few households (13 per cent) report that they have never grown mushrooms or have never been exposed to it in this way.

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At the height of the boom, the demand for rice straw swept many of the fields clean of the stubble usually left there after harvest, thereby decreasing food for the roaming buffalo and the small increment of nutrients usually plowed back into the soil.

The advantages of mushroom culture cited by Goldsen and Ralis (1957) were 1) the cash outlay required was small, 2) returns were realized quickly as the cycle was completed in two to three weeks, 3) little heavy work was required and 4) at the time when Ralis made the survey, a ready market was available. When, in 1957, the price dropped sharply, most of the growers gave up.

262 Food for Homage-to-the-Teacher Rite
435 Performed by a Buddhist Priest Who Was
796 a Traditional Practitioner
[431]
[792]
[875]

Item	Amount	Cost in Baht
Cereals and Legume Seeds:		
Rice noodles		10.
Soybeans & fermented vegetables	25 kg.	12.
Mung beans	10 lit.	25.
Cassava flour		2.25
Sugar and dessert:		
Palm sugar	1 pail	67.
Cane sugar	14 kg.	85.
(2)Kha-(5)nom (3)tuaj-(1)foo	500 cups	35.
Fish and Meat:		
Fish ((1)plaa (2)myk) for soup		6.
Silurus and serpenthead	60 kg.	gift
Fish and Meat (cont.):		
Dried fish	6	gift
Roasted fish	3 kg.	gift
Shrimp paste	2 kg.	18.
Lobsters		15.
Lobsters (for soup)		7.50
Pig's skin (for soup)		10.
Beef[1]	15 kg.	150.
Ingredients for Mussel-man curry[1]		27.
Boiled chickens[2]	2	22.
Pig's head[2]	4 heads	222.
Pork[2]	4 kg.	40.

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435
796
[815]

Food for Homage-to-the-Teacher Rite (cont.)

Item	Amount	Cost in Baht
Fruit:		
Bananas ((3)kluaj (4)nam-(4)waa)	5 bun.	from father
Chico[2]		5.
Coconut	150	180.
Coconut (young, to make dessert)	30	30.
Job's tears	1 lit.	3.
Plums, yellow[2]		5.
Pomelos[2]		6.
Rose apples[2]		2.
Tamarind		7.50
Tomato sauce		8.
Young palm fruit[4]	7 bun.	3.
Vegetables (non leafy):		
Bamboo shoots, cooked	1 pail	28.
[272] Cucumber		--[3]
[273] Egg plants		--[3]
[276] Garlic	5 kg.	26.50
Gourd, white		1.
Onion, fragrant[5]		6.
Onion[5]	4 kg.	4[3]
Onion, welsh[5]		--[3]
Mushrooms		3[3]
Radish, white		--[3]
[354] **Vegetables (leafy green and yellow):**		
Cabbages		--[3]
Chinese kale		--[3]
Chili, green		7.50
Vegetables (leafy green & yellow) cont.:		
Lettuce		--[3]
Parsley		--[3]
Pumpkin	3 fruits	12.
Sweet basil leaves		1.
Sweet potatoes	6 kg.	6.
(3)Tang-(5)oo		--[3]
Seasonings etc.:		
Vinegar	1 bottle	1.
Fishsoy	1 jar	10.
(2)Ka-(1)chaaj	2½ kg.	12.50
Sodium glutamate		5.
Pepper		14.
Agar	400 gms.	36.
Miscellaneous:		
Cola beverage	72 bottles	72.
Liquor	16 bottles	80.[6]
Ice		30.
Cigarettes	2 pkgs.	--[6]
Tobacco	1 heap	--[6]
Betel pepper		9.
Fresh areca nut		10.
Dried areca nut		8.
Dried palm leaves	1 big bundle	2.
Firewood		50.
	Total	1577.75

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[184]

[1] For Moslem guests.

[2] Food items placed on a tray and used in the ceremony proper.

[3] Items so marked cost a total of 140 baht.

[4] Not identified.

[5] Several kinds of onions, both fresh and dried, are commonly used.

[6] Prices not stated; estimate for liquor.

Food Preparation and Consumption Sept. 25, 1953 Household No. 21

Menu 1	Raw Ingredients Kind 2	Wt. A.P. 3	Cost 4 Bt.	Cost 4 Stg.	Ined. Ref. 5	E.P. 6	Cooked Foods Dish 7	Cooked Foods Dish + Food 8	Cooked Foods Food 9
Meal Time							800	2990	2190
4:30 a.m.		2180-800					120	1280	1160
Cooked rice	Polished	= 1380					190	850	660
									4010T[1]
(1) Bauaun stew	(leftover)						450	915	465
(2) Sa-(5)noo stew	Coconut meat (to make milk)	700-180 = 520		50		520)			
	Dried chilies	24		15		24)			
	Onion	8		4		8)			
	Galangal (HG)[2]	8				8)			
	Garlic	4		2		4)			
	Lemongrass (HG)	12				12)			
	Bergamot rind (G)[2]	4				4)	450	1350	940
	Salt	30				30)	130	312	182
	Serpenthead (C)[2]	320-120=200				200)	130	300	170
	Shrimp paste	6		3		6)	130	260	130
	(2)Sa-(5)noo flowers (G)	550			580-520 = 60	640-150 = 490)			1422T
	Coconut milk					1220-450 = 770)			
	Palm sugar	240-200= 40		24		40)			
Cooked rice	(leftover)						520	800	280
Fried duck egg	1 Duck egg	76			21	240-185 = 55			
	Coconut oil	16		8		16			
	Onion	4		2		4			
	Fishsoy	10		5		10	180	260	80

1. T equals total weight.
2. HG, G and C stand for home grown, gathered and caught, respectively.

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Food Preparation and Consumption (continued) Sept. 25, 1953 Household No. 21

Use of Cooked Foods						
Given away 10	Fed to Stock 11	Ed. Waste 12	Left Over 13	Eaten 1[illegible]	Persons Eating 15	Method of Preparation
Cooked rice 850-190= 660 (to 3 priests)			0	335	4	Rice, 4:30 a.m. She washes rice two times and lights the fire. Then she puts rice pot on fire at 4:35. Rice water is drained off at 5:00. Rice pot is put on fire again from 5:15 to 5:25.
			(1)Bauaun stew (leftover) 0	465		(1)Bauaun stew is reheated from 5:00 to 5:15 a.m.
(2)Sa-(5)noo stew 312-130=182 300-130=170 260-130=130 482T (to 3 priests)			0	940		(2)Sa-(5)noo stew, 5:20 a.m. Dried chilies (after soaking in water for a while), onion, garlic, galangal, lemongrass, bergamot rind, and salt all pounded together. 5:25 She crushes coconut meat with water five times over colander. Shrimp paste is mixed with (4)nam (4)phrig at 5:40. The pot of coconut milk is put on fire at 5:42. (4)Nam (4)phrig is mixed with boiled coconut milk at 5:55. Fish is put into the pot and water from crushed tamarind at 6:00, (2)sa-(5)noo flowers at 6:05. The pot is put down at 6:12 a.m.
			Cooked rice (leftover) 0	280		
			Fried duck egg 0	80		Fried duck egg. The pan is put on fire at 6:15 a.m. Duck egg is mixed with pieces of onion and fishsoy. Coconut oil is put into the pan at 6:20. Stirred egg is fried from 6:20 to 6:25.

Food Preparation and Consumption (continued) Household No. 222, June 4-5, 1953

K. Snacks

Person eating 1	Time 2	Kind and description 3	Weight (or approx. wt.) A.P. 4	Ined. ref. 5	E.P. 6	Cost 7 ⌀ Bt.	Stg.
			g.	g.	g.		
June 4/53							
Girl, 8 yrs.	12:00m	She ate a half fruit of pineapple at home. It was bought from the selling boat.	(375)	(195)	(180)		20
June 5/53							
Girl, 8 yrs. Boy, 10 yrs. Girl, 13 yrs.	All day	7:40 - The pot of truffles (gathered from the fields) is put on fire. It is boiled with water and salt. Truffles: 525-72 = 453 gm. Salt: 35 gm. It is finished at 8:28.	453				
Boy, 10 yrs.	8:46	He eats boiled banana (HG)	48				
Girl, 13 yrs.	Early a.m.	She drinks coffee which is bought from the store near the Wat.					40
Father	10:13	He drinks one glass of milk which is bought from the store near Wat.					50

Form for Calculating Raw Weights of Foods Eaten

Dietary Survey, Bang Chan — Household No. 12 — Date Jan. 14, 1954

Amounts of foods prepared and eaten — No. persons in household 3

Meal - menu	Raw ingredients				Cooked food	Use of cooked foods					Adjustments- raw wt.		
1	2[1]	3	5	6	9	10	11	12	13	14	For amt. eaten	15	For No. people
4:00 p.m.													
Cooked rice	Polished	610			1640				500	1140		3	
Baked egg plants	3 egg plants	370		370	240				0	240			
Fish "salad"	Lemongrass (HG)[2]	36		36)	115				0	115			
	Holy basil (HG)	44	20	24)									
	1 fish (cooked)	52	12	40)									
	Lime (1/2 fruit)	30	12	18)									
Cooked rice	(Leftover)				250				0	250			
6:55 a.m.													
Cooked rice	Polished	950			2390				800	1590		3	
Roasted fish	2 fish	112			96				0	96			
Cooked rice	(Leftover)				500				0	500			
Chili sauce	Bird pepper (HG)	12		12)	45				20	25			
	Shrimp paste	10		10)									
	Garlic	8		8)									
	Palm sugar	10		10)									
	Lime	12	4	8)									

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1. For identification of column numbers, see the original schedule, pp. 118-119 and pp. 113-114
2. HG stands for home grown.

2: Hauck et al. D,E-5 (1952-1954) 1958 AOT Central Thai AOT
Bang Chan

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Dietary Study, Bang Chan - Nutritive Value
of Total Foods Eaten in 24 Hours

Household No. 16

Date: July 23, 1953
Persons Eating: 8

Raw Ingredient	Adj. cons.	Cal- ories	Pro- tein gm.	Fat gm.	Carb. gm.	Ca mg.	P mg.	Fe mg.	Vit. A I.U.	B_1 mg.	Ribo. mg.	Nia- cin mg.	Vit. C mg.
Rice, home milled	3877	14074	295	43	3036	426	8568	46.5	(0)[1]	7.37	1.94	120.2	0[1]
Dried fish	450	864	189	7	0	293		11.3	0	0.27	1.40	20.7	0
Bottle gourd	1535	261	9	3	58	184	276	9.2	1075	0.61	0.77	15.4	154
Swamp cabbage	480	139	14	1	26	350	245	12.0	30240	0.34	0.58	3.4	154
(2)Phag (2)ka-(2)cheed	40	11	1	0	2	66		1.2	2400	0.04	0.08	0.3	28
Coconut milk[2]	1010	735	8	59	42								
Pork fat	36	325	0	36	0	0	0	0	0	0	0	0	0
Fishsoy	48	23	2	2					0	0.01	0.04	1.1	
Shrimp paste	16	19	4	0					0	0	0.02	1.0	-
Chilies, dried	20	49	3	1	6	32	74	0.5	115	0	0	0	10
Garlic	16	15	1	0	4	7	21	0.2	0	0.04	0.01	0.1	2
Bird pepper	10	3	0	0	1	2	-	0.1	600	0.01	0	0	20
Onion	4	1	0	0	0	1	2	0	2	0	0	0	1
Lime	4	2	0	0	1	(2)	(1)	(0)	0	(0)	(0)	(0)	1
Palm sugar	25	96	0	0	24	20	10	2.9	0	0	0	0.3	0
Salt	20	0	0	0	0	46	0	0.1	0	0	0	0	0
Total		16617	526	152	3200	1429	9197	84.0	34432	8.69	4.84	162.5	370
Average/cap.		2077	66	19	400	179	1150	10.5	4304	1.09	0.60	20.3	46

1. ( ) means imputed value; 0 means none or insignificant amount; - means no values available, but probably contains measurable amount; blank space means no information found.
2. See Appendix C, pp. 128-129.

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Dietary Study, Bang Chan - Nutritive Value[1]
of Total Foods Eaten in 24 Hours

Household No. 12

Date: Jan. 14, 1954
Persons Eating:

Raw Ingredient	Adj. cons.	Cal-ories	Pro-tein gm.	Fat gm.	Carb. gm.	Ca mg.	P mg.	Fe mg.	Vit. A I.U.	B_1 mg.	Ribo. mg.	Nia-cin mg.	Vit. C mg.
Rice, polished	1335	4806	91	9	1053	80	1869	10.7	(0)	1.60	0.40	20.0	(0)
Egg plant	370	89	4	1	20	56	137	1.5	111	0.15	0.19	2.2	19
Fat fish	152	275	28	18	0	56	321	1.5	0	0.09	0.06	6.1	0
Lemongrass	36												
Holy basil	24	23	2	0	4	19	2	0.7	3024	-	0.55	-	1
Lime	22	8	0	0	3	9	5	0.1	0	(0.01)	0	0	6
Bird pepper	7	2	0	0	0	1	-	0.1	402	0	0	0	13
Shrimp paste	6	6	1	0	0				0	0	0.01	0.3	
Palm sugar	6	21	0	0	5	4	2	0.6	0			0.1	
Garlic	4	4	0	0	1	2	6	0	0	0.01	0	0	1
Total		5234	126	28	1086	227	2342	15.2	3537	1.86	1.21	28.7	40
Average/cap.		1745	42	9	362	76	781	5.1	1179	0.62	0.40	9.6	13

1. ( ) means imputed value; 0 means none or insignificant amount; - means no values available, but probably contains measurable amount; blank space means no information found.

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Foods for Which Values Were Obtained from Miscellaneous Sources, or Imputed by the Authors

Name of Food	Source or Basis for Imputed Values
Cereals	
Rice, glutinous, black	Values for glutinous rice
Animal Foods	
Fermented fish	Values from Thai table; vitamin analysis for FAO by Hoffman-La Roche, Ca value from Knudson (1955).
Shrimp paste	Values from Thai table; vitamin analysis for FAO by Hoffman-La Roche.
Fishsoy	Values from Thai table; vitamin analysis for FAO by Hoffman-La Roche.
Field rats	Values from Chatfield et al. for mammals, dressed.
Fruits	
(2)Ma-(1)dan, fruit	Leung et al. Unspecified fruits, tropical areas.
Manila tamarind	Leung et al. Unspecified fruits, tropical areas.
Rambai	Willimott
Thai nutmeg	Values for persimmon
Vegetables	
(1) Bauaun	Values for eggplant
Bergamot rind	Aykroyd et al., values for lime peel.
Celery leaves, Chinese	Values for celery leaves and stalks, Chinese.
Coral	Leung et al., values for dark green leaves
Cucumber	Watt et al., for figures for Fe and Vitamin A in cucumber with skin.

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Galangal	Leung et al., values for ginger root.
(1)Jauau	Leung et al., values for dark green leaves.
(3)Khii-(2)leg	Leung et al., values for dark green leaves.
(4)Khlyb	Leung et al., values for dark green leaves.
Lotus stalk	Leung et al., values for lotus root.
(2)Ma-(1)dan leaves	Leung et al., values for dark green leaves.
(4)Ma-(5)khya (2)khaj (2)taw	Values for eggplant.
Morinda	Leung et al., values for dark green leaves.
(2)Phag (2)ka-(2)cheed	Leung et al., values for dark green leaves.
Sweet potato	Chatfield, values for vitamin A in pale variety.

Foods for Which Nutritive Values Were Not Calculated and the Total Amounts Eaten by Two Groups of Households Throughout the Survey

Name of food	Amounts Eaten Group A	 Group B
	g	g
Bergamot leaves	5	15
(2)Ka-(1)chaaj	15	71
(2)Kha-(1)cauaun flowers	25	0
Lemongrass	135	154
(2)Sa-(5)noo flowers	216	1078

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List of Foods[1] Included in Each Food Group

I. Rice and other cereals

Popcorn
Rice flour
Rice, glutinous
Rice, glutinous, black
Rice, home-milled
Rice, noodles
Rice, polished
Wheat bread

II. Fish and other animal foods

Beef
Chicken
Crab, salted field
Eel
Eggs, duck
Eggs, hen
Fish, canned
Fish, dried salted
Fish, fermented
Fish, fresh
Fishsoy
Frogs
Milk
Oysters, dried
Pork
Rats, field
Shrimp paste
Water buffalo

III. Green and leafy vegetables

Beans, string
"Bergamot" leaves (Citrus hystrix)[2]
Chilies, fresh, green and red (Capsicum annuum)
Chilies, small, or bird-pepper (Capsicum frutescens)
Chinese celery (Brassica pekinensis)
Coral (Erythrina fusca)
(2)Kha-(1)cauaun leaves (Telosma cordata)
(3)Khii-(2)leg (Cassia siamea)
(4)Khlyb (see footnote p. 30.)
Leeks
Lemongrass (Cymbopogon citratus)[2]
Lettuce, head
(4)Ma-(1)dan leaves (Garcinia schomburgkiana)
Morinda, (1)jauau (Morinda citrifolia)
Onion leaves
(2)Phag (2)ka-(2)cheed (Neptunia prostrata)
(2)Sa-(1)daw (Melia indica)
(2)Sa-(5)noo, leaves and flowers (Sesbania roxburghii)[2]
Swamp cabbage, (2)phag (3)bung
Sweet basil (Ocimum basilicum)

IV. Other vegetables

(1)Bauaun - (a member of the Araceae (arum family) perhaps a species of Alocasia)
Bamboo shoots
Bean, mung
Bean, sprouts
Calabash
Cassava
Chili, dried
Cucumber
Egg plants
Garlic
Gourd, bitter (Momordica charantia)
Gourd, bottle (Lagenaria leucantha)
(2)Kha-(1)cauaun flowers (Telosma cordata)[2]
Leeks, flowers
Lotus stems (Nelumbo nucifera)
Mushrooms, straw
Onion, mature or bulbs
(2)Phag (2)tob (Eichhornia crassipes)
Peanuts
Radish, white
Radish, salted
Sweet potato (pale yellow)

262 Other vegetables (continued)

Taro
Turmeric, white
Water chestnut, Chinese or black truffle (Eleocharis dulcis)
West Indian pea tree, (1)Khaeae flowers, (Sesbania grandiflora)

V. Fruits

Coconut and its products

Coconut meat
Coconut sport
Coconut milk
Coconut cream

Fruits other than coconut

Banana, (3)kluaj (4)nam-(4)waa
Guava (Psidium guajava)
Hog plum (a species of spondias)
Jack fruit (Artocarpus heterophyllus)
Jujube (Zizyphus jujuba)
(2)Ka-(4)tauaun (Sandoricum indicum)
Limes
Lotus seeds (Nelumbo nucifera)
(4)Ma-(1)dan fruit (Garcinia schomburgkiana)
Mango
Manila tamarind (Pithecellobium dulce)
Muskmelon
Olive
Orange, sour
Orange, sweet
Papaya
Pineapple
Rambai, (4)ma-(1)faj (Baccaurea sapida)
Rambutan (Nephelium lappaceum)
Star gooseberry (Cicca acida)
(2)Ta-(1)koo (a species of Diospyros)
Tamarind (Tamarindus indicus)
Thai nutmeg (a species of Diospyros)
Watermelon

VI. Fats and oils

Coconut oil
Pig's skin
Pork fat

VII. Sugar

Palm sugar
Sugarcane

VIII. Miscellaneous and spices

Agar
Bergamot, rind
Cardamom
Cinnamon
Coriander seeds
Fennel
Galangal (Alpinia officinarum)
Ginger (Zingiber officinale)
Holy basil (Ocimum sanctum)
(2)Ka-(1)chaaj (Boesenbergia pandurata)[2]
Nutmeg
Pepper, black
Salt
Vinegar

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[104] 1. English names, where known, are given first. Thai terms are given where no common English name was known. Both Thai terms and scientific names are given for plants which may be unfamiliar to many Western readers.

2. Foods for which no nutritive values were found nor imputed.

NOTES ON THE PREPARATION AND NUTRITIVE VALUE OF COCONUT MILK AND COCONUT CREAM

252 The term coconut cream ((5)hua (2)ka-(4)thi), as it
262 was used in Thailand, referred to the product which was made
by squeezing grated coconut with little or no addition of
water. Coconut milk ((4)naam (2)ka-(4)thi) was made by
squeezing grated coconut repeatedly with water. Coconut
cream might be made first, and the residue extracted one or
more additional times to obtain coconut milk. The terms
coconut milk and coconut cream apparently are not used con-
[014] sistently. Losee (1952) commented on this when he described
[171] the preparation of coconut cream in Samoa, and said that it
was sometimes called coconut milk. Miller et al. (1936), in
describing the preparation of coconut milk said "If a thick
coconut milk to serve over puddings, taro leaves, etc. is de-
sired, 1/2 to 3/4 cup of coconut water or boiling water should
be poured over 3 cups of grated coconut. . . . If the milk is
to be used in curry sauce for chicken, eggs, shrimps, or in
cornstarch pudding, a larger quantity of water (1 to 2 cups
of water to 3 cups of grated coconut) may be used."

126 In carrying out the dietary study, the observer weighed the grated coconut meat, the residue and the final products, coconut milk or cream, or both. She did not weigh the water as it was added in successive portions, but the amount of added water could be calculated.

184 The ratio of coconut milk to meat varied considerably,
262 but on the average, households in Group A obtained coconut
milk which weighed more than eight times as much as the coco-
nut meat from which it was made. Households in Group B ob-
tained less than 2½ times as much milk by weight as coconut
meat. The number of extractions made varied from 2 to 6,
146 with a mode of 3. Obviously, the products made by Groups A
171 and B, although both called coconut milk, had markably differ-
262 ent percentage composition, and neither was similar to "coco-
nut milk" for which values could be found. These values were
as follows:

Authors	Location	Coconut milk grams per 100 gm. E. P. Pro.	 Fat	 Carbo.
Bocobo et al.	Philippine Islands	3.6	33.2	38.4
Food and Drug Division	Thailand	3.52	34.75	1.52
Miller et al.	Hawaii	4.0	27.0	18.9[1]

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[1] Personal communication

128 146 262 In calculating values to be used in our estimates of nutrient content of diets in Bang Chan, we made two assumptions: 1) that the "expressed coconut milk" described by Miller et al. was similar to coconut cream as made in Bang Chan, and 2) that coconut milk as made in Bang Chan differed from coconut cream primarily by dilution. When coconut milk was made by successive extractions after coconut cream had been prepared, the combined weights of cream and milk were taken to represent the yield of coconut milk from the weight of meat used.

The ratio of coconut cream to coconut meat was approximately the same, 0.30 for households in Group A and 0.33 for those in Group B, but Group A used more water in making coconut milk than Group B. By calculation, we obtained the following figures for the percentage of protein, fat and carbohydrate in coconut milk as made in the two groups of households.

Estimated Composition of Coconut Milk as
Made in Two Groups of Households, Bang Chan

	Grams per 100 gm. E. P.		
	Protein	Fat	Carbo.
Group A	0.15	1.0	0.7
Group B	0.5	3.6	2.4

The need for a guide for calculating composition of various coconut milks, based on actual analysis of the products as made at home is apparent. Since coconut milk was used almost daily in Bang Chan, use of the figures which we found in the literature would have introduced a major error into our calculations. Using figures from the table designed for use in Thailand (Food and Drug Division, Bangkok, 1953), the average per capita caloric intake per day, from this source for the families studied would have been over 300 calories, as compared to about 45 calories, using the figures calculated on the basis of observed procedures in the village.

/Pp. 130-139 contain no data on Bang Chan and the Central Thai and were not processed for the AO7 Central Thai file./

A small, rather flavorless banana was given to young babies, 853
sometimes before they were put to the breast. This type of banana and soupy rice were the only supplementary foods given before 6 months of age. Protein-rich foods, chiefly fish and egg, were generally introduced in small amounts during the second half of the first year. Few infants were given vegetables before one year of age, and even then none had them daily. At two years of age, some children had not yet been given green vegetables. Late introduction of vegetables into the child's diet may be due to the fact that vegetables were often prepared as hot curries which were considered unsuitable for young children.

A child was usually allowed foods commonly eaten by adults by the time he was weaned, although a few informants specified that the child could have anything but "hot tasting" foods, i.e. foods containing chili. A minority of informants mentioned other foods as not good for younger babies.

Except for dietary restrictions while the mother was lying 846
by the fire, postpartum, no well established dietary taboos 853
connected with the feeding of mothers or babies were encountered.
The concept that a good choice of food is important to the health 262
of both mother and child seemed to be entirely lacking.

Many of the young children in Bang Chan failed to gain, or 145
even lost, weight in the intervals between observations. Almost all infants appeared to gain steadily up to 6 months of age, but stationary weight or weight loss for periods of from 1 to 7 months was observed in most children at some time. These periods were noted more frequently among children from 2 to 3 years old than among younger ones. Such experiences were not more common after weaning than at other times, but the cause or causes of growth failure could not be determined from the information available.

Some approaches to improvement in the diet of Thai mothers 252
and children are suggested. Improvement in the diets of mothers and small children would probably parallel any improvement in the general family dietary, since food is prepared at one time for all members of the family.

Exposure of Infants to Sunlight.

854 Even during the rainy season sunshine was usually abundant in Bang Chan, but taking a baby out of doors at an early age was generally thought to involve some risk. Many houses had low or wide eaves, and an infant was usually kept in a cradle in the house where sunlight could not penetrate. When old enough to hold up its head while sitting astride an older person's hip, the infant might be carried about the compound by parents or older siblings. As the question was worded ("When did you take the baby outside the house?" or "At what age did you take the baby with you when you went out for pleasure?") the answer did not mean that the baby was taken out with any degree of regularity at the specified age. Most of the babies in this series had been taken outdoors by the time they were 3 months old, but 4 were a year or older when first exposed to [164] sunshine. Nevertheless, the physician found no evidence of rickets among the infants he examined.

One informant, a school teacher's wife, said she thought that taking the baby into the sunshine was not harmful; in fact she believed it made the baby stronger than usual. She thought, however, that too much exposure to sunshine might "bring cold into the baby" and she spoke of the beret as a protection against this.[1] In Bang Chan, an otherwise naked infant might wear a beret when being taken out of doors.

MATERNAL DIET

Diet During Pregnancy.

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262 Of 31 mothers who furnished some information on diet during pregnancy, 17 were pregnant when interviewed, and the remainder had young infants, in most cases under 3 months of age. Eighteen [125] of the interviews were based on schedule 4 (Appendix p. 83) and provided fairly detailed information on the kinds of foods eaten. Other informants gave more general information, such as foods craved or disliked.

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[171] [1] Wellin (1956) mentioned the small woolen cap made or bought by mothers in the Valley of Ica, Peru, for the infant to wear. The cap was put on soon after birth and was worn, off and on, for many months. The function of the cap was to prevent the entrance of cold via the fontanel, which was defined as a particularly vulnerable point of entry. Wellin noted that all infants he saw in maternity wards in the Valley of Ica wore woolen caps.

In general, the diet during pregnancy seemed to be about the same as at other times. Rice cooked in the usual way (see glossary, Appendix p. 51) and fish of some kind formed the basis of the diet. A majority had green vegetables[1] either daily or frequently. Foods which seemed to be generally acceptable, although they were eaten less often, included vegetables other than green ones, pork, bananas, coconut, other fruit, fresh beef, and egg. 843 262

Eight women spoke of foods which they craved during pregnancy. Fruit in general, or specific fruits such as oranges, pomelo, guava, rambutan, and mangosteen, were most often mentioned. One woman said she craved Chinese noodles, and one, chilies.

When asked whether they disliked any foods during pregnancy, 5 women mentioned fish or the odor of fish, but in 2 instances the objection was limited to early pregnancy when the informants experienced some nausea. Three said they disliked vegetables, and one, hot tasting foods.

Four informants said that hot tasting foods (i.e. foods containing chili peppers) were bad for a pregnant woman; one considered dried and salted fish harmful "because of their fishy odor." One informant thought eggs were bad for a woman during pregnancy. Eggs were, however, the only food mentioned by anyone in Bang Chan as being good for pregnant women. The informant, a woman school teacher, said she ate them often anyway, hence did not alter her intake during pregnancy.

Diet During the Postpartum Rest Period.

Of the 42 mothers from whom we obtained information about the food they ate during the postpartum rest period, only 2 said they ate as usual. One of these said she believed that if a mother ate small amounts of many different kinds of foods while lying by the fire, the child would not get diarrhea when he ate these foods for the first time. This woman worked outside the community and may not have acquired her belief about eating a variety of foods within the village. In any event, since her child died at five days of age, one would not expect this mother's eating behavior to have a liberalizing effect on the custom in 846 262

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[1] Most of the pregnant women were interviewed toward the end of the rainy season when swamp cabbage and (2)phag (2)ka-(2)cheed, the most popular leafy vegetables, were available. From our subsequent experience with the family dietary survey, one would expect that when canals were low, green vegetables would be eaten infrequently by pregnant women as well as by other members of the family.

846 262 Bang Chan. The only other woman in this series who did not restrict her diet postpartum was the wife of a school teacher. She said that women were supposed to eat rice with salt or salt fish at this time but that she ate all kinds of food.

As a rule, a woman's diet was considerably curtailed during the postpartum rest period. Rice and fish were apparently the only foods considered safe by all of the mothers interviewed. About half ate fish, but over half of these ate salted fish only, and about one-fourth ate fresh fish only. The only other food eaten by half or more of the mothers was banana of the (4)nam-(4)waa variety, baked bananas being commonly specified. Vegetables, when they were eaten, were usually in (1)kaeaeng (1)liang, a broth made with dried fish and reputed to be valuable for milk stimulation. In Bang Chan, the inflorescence of banana was commonly used in making this product, but other vegetables were favored by some.

When asked what foods they considered good for a woman who had recently borne a child no mother knew of any such food, but the list of foods mentioned as being bad for the mother during the postpartum rest period included more than a dozen items mentioned from 1 to 4 times each: egg, sweets, beef, vegetables, meat, pork, poultry, fresh fish, sour tasting foods, jackfruit, mangoes, fruits of all kinds, and glutinous rice.

[829] Fear of illness from eating incompatible foods after childbirth was rather strongly expressed by many informants, even by some who knew of Chinese customs which were different from the ancient Thai customs. Some also knew that foods which were customarily forbidden to the woman who had her child at home were not forbidden at the government Health and Maternity Center at Minburi.

Diet During Lactation.

853 262 The term "diet during lactation" as used here refers to foods eaten when the mother had resumed her usual work following the postpartum rest period. The majority of nursing infants were under a year old when the records were obtained. All of the mothers ate rice everyday cooked in the usual way, and almost all had fresh, dried, or salted fish. About two-thirds had vegetables of some kind daily, but 6 women reported that vegetables of any kind were eaten only occasionally. Coconut, which as coconut milk is the basis for many curries, was used often. One nursing mother ate bananas daily, and about two-thirds of these women had bananas either occasionally or frequently. Only five women mentioned eating other fruits.

Three reported eating eggs daily,[1] and about two-thirds of the women had them either occasionally or frequently. Animal foods other than fish or eggs were eaten infrequently by most nursing women. 853 262

Our questions about ideas concerning foods during lactation did not uncover any firmly established traditional behavior. No food was considered harmful by a majority of informants. In response to the question as to foods which should not be eaten during lactation, however, 12 kinds of food and 4 attributes of food (sour, hot tasting, raw, fermented) were mentioned 37 times. Jackfruit, the item which occurred most frequently, was mentioned 8 times, corn, 3 times, swamp cabbage and pork, twice each; other items such as legumes, beef, poultry, egg, pineapple, and chico, once only. When asked if they disliked any foods at this time 4 women mentioned a dislike for vegetables. One mother said that cooked foods (in contrast to raw ones) were good for a lactating woman. Our question about foods craved during lactation brought little response.

To sum up, the mother's diet during pregnancy and lactation often approximated the usual diet in Bang Chan. A few women said they craved certain foods during pregnancy and some mentioned foods disliked at that time. A number of food items and attributes of food were considered by some informants to be undesirable during pregnancy and lactation, but no item was mentioned so frequently as to be considered tabooed. During the postpartum rest period, however, a greatly restricted diet was common. Mothers apparently had no idea of special dietary needs during pregnancy or lactation. 843 853 262 [846]

FEEDING PRACTICES FROM BIRTH TO TWO YEARS OF AGE

This description of feeding practices is based on 256 interviews concerning 57 infants and small children. The majority of them were visited from 5 to 7 times each. Since, insofar as possible, we saw the babies at 3-month intervals, changes in feeding practices will be described by 3-month periods or multiples thereof. If each visit to a child is considered as unity, the 8 age groups from birth to two years included from 17 to 41 children each with 6 of the age groups including more than 30 individuals. Thus the data obtained may be assumed to provide a reasonable picture of baby feeding practices in Bang Chan, 1952-54, and of significant deviations therefrom. 125 853 but additions of rice water, coconut milk, and salt[1] were more common from 3 to 6 months. A few infants less than 6 months old were given rice from the family pot cooked in the usual manner.[2] No other foods were introduced before 6 months of age. 853

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[1] This does not mean that the mother ate a whole egg at one meal. Frequently one or two eggs might be used to prepare food for the entire family.

A majority of infants from 6 to 8 1/2 months[3] of age were given ordinary rice, although for some, excess water was not drained off and special mashed soupy rice was still given to others. Fishsoy, (4)nam (1)plaa, might be added for both salt and flavor. Several mothers said that when the baby had teeth he could begin to eat ordinary rice. At this time also the infant was given some other items which were considered as adult food (Table 3).4 A few were fed protein-rich foods, i.e. fresh, dried, or salted fish, egg, meat, or poultry, between the sixth and ninth months. One child in this age group was given banana other than (3)kluaj (4)nam-(4)waa (kind not specified), and four infants had fruit other than banana frequently or occasionally. Orange, mango, guava, roseapple, and rambutan were mentioned according to season. Some kinds of (2)kha-(5)nom, which included purchased crackers, biscuits, or cookies as well as some sweet items which we would call desserts,[4] were given also, at least occasionally, to many babies over 6 months of age.

Among infants from 9 to 11 1/2 months of age increasing use of protein-rich foods, primarily fish and egg, was noted. Fruits other than the small (4)nam-(4)waa banana and (2)kha-(5)nom were also given to more infants. A few were given vegetables before one year of age, but none had them daily (Table 3).3

Diet During the Second Year of Life.

For most of these babies breast feeding was continued into the second year. By this time almost all were given ordinary rice, and more than half had fish daily with fresh fish being fed more often than dried or salted fish. A few babies between

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1. In Thailand rice is not salted during cooking. [263]

2. See (3)khaaw (3)suaj, glossary p. 51. (151)

3. The nearest half month marked the dividing point between age groups. Thus an infant 8 months 20 days old would be considered as 8 1/2 months old and one 8 months 23 days old would be considered as 9 months old. [125]

4. Neither such (2)kha-(5)nom nor fruit were included in the usual family meals, but school children often bought them as snacks to eat at noon recess (Hauck et al., 1958; Hauck and Hanks, 1959). [262]

4 [See p. 19 - Analysis] 3 [See p. 20 - Analysis]

853 Table 2. Food Intake Other Than Milk of 32 Infants From 6 to 8 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Milk					
		Rice	Banana	Other Fruit	Fish	Egg, Meat or Poultry	(2)Kha-(5)nom
1	0						
10	1	9					1
10	2	10	10				
4	3	4	4			3	1
3	4	3	2		3	2	2
1	5	1	1	1	1		1
3	6	3	3	3	3	3	3
Total	D[2]	29	9		3	4	2
32	F	1	6	1	1	3	3
	O		5	3	3	1	3

1. The nearest half month marked the dividing point between age groups. Thus an infant 8 months 20 days old would be considered as 8 1/2 months old and one 8 months 23 days old would be considered as 9 months old.

2. D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervals).

[262] 12 and 14 1/2 months of age were given egg daily, and almost all had egg either frequently or occasionally. About half the babies of this age were fed poultry or meat occasionally, but neither of these items was common in the family diets observed in Bang Chan (Hauck et al., 1958; Hauck and Hanks, 1960). At this age only 1 of 41 babies was given green vegetables daily, and less than one-third of them had vegetables of any kind even occasionally (Table 4). A

855 262 As the children grew older they had vegetables more frequently, so that between 15 and 20 1/2 months of age almost half of the children ate vegetables at least occasionally (Tables 5 - 8). B A few two-year old children had never had green vegetables; for many, even at this age or older, vegetables of any kind were occasional rather than frequent items of diet.

[271] Of the 23 children between 21 and 24 1/2 months of age for whom we had records, 5 were still being breast fed, and one (the orphaned child) continued to receive imported cow's milk diluted with boiled water. All drank untreated canal or rain water according to the available supply. All were fed rice cooked in the usual manner, but one still had soupy undrained rice at times.

A [See p. 20 - Analyst] B [See p. 21-22 - Analyst]

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Table 5. Food Intake Other Than Rice of 11 Weanling Babies From 15 to 17 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Rice				
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
1	2	1	1			
6	4	6	6	6		6
4	5	4	4	4	4	4
Total 11	D[2]	10	2	3	1	3
	F		5	7		2
	O	1	4		3	5

1. The nearest half month marked the dividing point between age groups. Thus an infant 17 months 20 days old would be considered as 17 1/2 months old and one 17 months 23 days old would be considered as 18 months old.

2. D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervals).

Table 6. Food Intake Other Than Milk and Rice of 30 Babies 15 to 17 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Milk and Rice				
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
1	1	1				
1	2	1				1
3	3	3	3	1		2
12	4	12	12	12	1	11
13	5	13	13	13	13	13
Total 30	D[2]	23	2	2	1	10
	F	4	11	16	2	9
	O	3	15	8	11	8

1. See Footnote 1, Table 5.

2. See Footnote 2, Table 5.

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Table 7. Food Intake Other Than Rice of 14 Weanling Babies From 18 to 20 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Rice				
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
2	2	2		2		2
4	4	4	3	4	1	4
8	5	8	8	8	8	8
Total	D[2]	11	2	1	2	8
14	F	3	6	8	1	5
	O		3	5	6	1

1. The nearest half month marked the dividing point between age groups. Thus an infant 20 months 20 days old would be considered as 20 1/2 months old and one 20 months 23 days old would be considered as 21 months old.

2. D = daily, F = frequently (at least once a week), and O = occasionally (at longer intervals).

Table 8. Food Intake Other Than Milk and Rice of 18 Babies From 18 to 20 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Milk and Rice				
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
3	3	3	2	1		3
9	4	9	9	9		9
6	5	6	6	6	6	6
Total	D[2]	14	1	3		7
18	F	3	11	5		7
	O	1	5	8	6	4

1. See Footnote 1, Table 7.

2. See Footnote 2, Table 7.

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Table 9. Food Intake Other Than Rice of 17 Weanling Babies From 21 to 24 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Rice				
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
6	4	6	6	6	1	5
11	5	11	11	11	11	11
Total	D[2]	16	1	2	3	7
17	F	1	8	6	1	3
	O		8	9	8	6

1. The nearest half month marked the dividing point between age groups. Thus an infant 24 months 20 days old would be considered as 24 1/2 months old and one 24 months 23 days old would be considered as 25 months old.

2. D - daily, F - frequently (at least once a week), and O - occasionally (at longer intervals).

Table 10. Food Intake Other Than Milk and Rice of 6 Babies From 21 to 24 1/2 months Old.[1]

No. of Infants	No. of Food Items	Number of Infants Fed Food Items Other Than Milk and Rice				
		Fish	Egg, Meat or Poultry	Fruit	Vegetable	(2)Kha-(5)nom
6	6	6	6	6	6	6
Total	D[2]	5				3
6	F	1	4	3		2
	O		2	3	6	1

1. See Footnote 1, Table 9.

2. See Footnote 2, Table 9.

Fish, fresh, dried, or salted, depending on the family fare, was a regular part of their diet (Tables 9, 10).[A] One had egg daily, and 10, frequently; but for more than half of them egg, as well as meat or poultry, was an occasional item of diet. All were fed (2)kha-(5)nom, and almost half had something in this class of foods daily. Only three had green or other vegetables daily and 3 never ate them. Bananas of the (4)nam-(4)waa variety were eaten by all, but only one had banana daily while more than half had them only occasionally. Four were sometimes given bananas other than (4)nam-(4)waa, the variety which was considered safe for infants and invalids. Two had never had other fruit, but most children of this age were occasionally given other seasonal fruit. The variety of foods other than milk given to these children did not appear to depend on whether or not they had been weaned (Tables 5 - 10). 855 262

Weaning.

Some of the children in this series had been weaned before our observations were started, and 19 had not been weaned when last visited. For 30 children the period of observation included weaning (Table 11), and in most cases enough records were obtained so that the effect, if any, of weaning on the weight curve could be ascertained. 862

Table 11. Age at Weaning for 37 Babies and Number for Whom Weight Records Before and After Weaning were Obtained, Bang Chan, 1952-54.

Approximate Age At Weaning	Number of Babies	
	Total	Weighed Before And After Weaning
(months)[1]		
5	1	0
9	1	1
11	1	1
12	8	4
13 - 14	5	5
16 - 17	2	2
18 - 19	8	7
20 - 22	7	6
25	2	2
28	1	1
36	1	1
Total	37	30

[1] Because of the method of choosing children for study, the majority of those observed were under two years of age. We have no basis for judging what proportion of children in Bang Chan were breast fed beyond two years of age.

[A] [see p. 22 - Analyst]

[125]

862 In Bang Chan infants less than a year old were seldom weaned. Of 3 such cases we encountered, the mother of one was ill with tuberculosis, and the other two mothers were again pregnant. Common answers to the question, "When should a baby be weaned?", were: "When it is a year old", or "At 1 1/2 years", or "When the mother is pregnant again." Mothers commonly nursed one infant until 3 to 7 months pregnant with the next. More than half of the children who were nursed longer than 18 months had no younger sibling during the period of this study.

Of 32 mothers who described the weaning procedure, 13 painted the nipples with boraphed or other bitter substance (lime or aloe), but an equal number said they did nothing. Six mothers gave other food instead of breast milk. In 4 cases cow's milk[1] was given; in one, bananas and (2)kha-(5)nom; and in one instance the food substitute was not specified.

Weaning in Bang Chan usually meant the end of milk feeding, but 5 babies in this series were given cow's milk feedings after weaning. These included the infant who was weaned at 5 months because of the mother's illness and two others who were weaned because of a pregnancy. The child who had been given cow's milk when the mother was away vending continued to have cow's milk at night, after weaning.

Beliefs About Foods for Babies.

853 155 262 **Foods "Good For" Or "Not Good For" Babies.** - In addition to asking what foods were given the baby, we asked mothers (or other informants) what foods they considered "good for" or "not good for" the baby. Informants were not prompted by asking about specific foods. The most usual answer was that the informant did not know or did not consider any food either especially suitable or unsuitable. Only 6 informants mentioned foods considered good for the baby (Table 12).[A] One of these named 3 such foods: egg, fish, and vegetables.

A larger number of informants reported that one or more foods were not good for a baby, but in a majority of instances (30 of 50 replies) the informant did not mention any food in this category. In all, 15 foods and 2 characteristics of foods

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[1] No fresh milk of any kind was available in Bang Chan. Water buffaloes were ordinarily not bred in the village, and use of buffalo milk was unheard of. Among the light refreshments which could be bought at village stores, however, were coffee with condensed milk and diluted canned milk. Storekeepers stocked imported canned and dried milk including some brands designed for infant feeding. Directions for use were not in Thai, however, and the preparations actually fed to infants were often diluted more than recommended.

[A] [see p. 26 - Analyst]

("hot tasting" and "hard") were mentioned 39 times (Table 13) with jackfruit and chico being mentioned in connection with the same baby at both 6 and 9 months of age. 853 855 262

Table 12. Foods Considered Good for Babies.

Food	Number of Informants	Age of Baby at Time of Inquiry (months)
Rice	3	3, 15, 36
Egg	2	6, 15
Fish	2	15, 18
Vegetables	1	15

There was no indication that any food was considered harmful by most mothers. Although the list of foods considered not good for babies was considerably longer than the list of foods considered good for them, the item which occurred most frequently, jackfruit, was mentioned by only 6 informants. Eggs, vegetables, and fish were considered by some as good for the baby and by others as harmful (Tables 12 and 13).

Table 13. Foods Considered Not Good for Babies.

Food	Number of Informants	Age of Baby at Time of Inquiry (months)
Jackfruit	6	5, 6 and 9[1], 11, 18, 21, 22
"Hot tasting" foods	6	12, 14, 15, 24, 24, 27
Chico	4	6 and 9[1], 11, 21, 22
Egg	3	7, 11, 27
Sugar	3	9, 11, 12
Banana (ordinary "fragrant" type)	2	21, 22
Hard things	2	6, 10
Glutinous rice	2	9, 11
Fish	1	9
Fresh fish	1	18
Vegetables	1	6
Mango	1	6
Raw banana	1	6
Corn	1	18
Guava	1	18
Orange	1	15
"Ice"[2]	1	36

1. Mentioned for same child at both 6 and 9 months.

2. Either a frozen syrup or syrup over shaved ice.

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843 Reasons were seldom advanced for considering certain foods
unsuitable for mothers or children. During pregnancy the hot-
tasting foods, i.e. those made with chili, were said by one
262 informant to injure the baby's complexion. When asked at what
855 age a child could have adult food, mothers might say at one or
two years but often specified, without giving a reason, that
953 they could have anything but the "hot-tasting" foods (foods
seasoned with chili). Two mothers said the child could have
"hot tastes" at one year, whereas one said not until the child
was 3 years old. A majority did not specificlly mention hot
tasting foods either to include or to exclude them.

853 A reason given for omitting jackfruit from the diet during lactation was that it would cause diarrhea in the baby. One informant said that if a mother nursing a young baby 1 or 2 months old ate fresh vegetables, the baby would have diarrhea. Some informants said the "fragrant banana", (3)kluaj (5)hauaum[1], caused constipation in infants, others that it caused diarrhea, whether eaten directly by the infant or by the mother.

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855 The belief that eggs would cause dental caries and should therefore be omitted from children's diets was expressed by the mother in a poorly nourished family of low economic status.

862 Opinions varied as to when children could be given "adult food". This was often, but not always, the age considered appropriate for weaning. As the question was worded it apparently implied that the child "could eat food as prepared for adults in the family" and did not necessarily exclude breast feeding, since children who "could have adult food" might still be nursing. The age at which a child could have adult food was sometimes related to stage of maturity as "when he can sit", "when he has teeth", or "when he can say (1)plaa (fish)".

262 Traditional and Modern Concepts of Rice Versus "With-Rice" in the Diet. - Rice is not only the basis of the adult diet in Thailand, but it has traditionally been regarded as the strength giving food par excellence. A portion of Chutima's (1939) description of the "old system" of diet follows:

> "Our children and young women are forbidden by ancient doctrine from eating any fair quantity of animal products, but must eat plenty of rice which is considered as the only true food, the others being only appetizers. And to stimulate the palate, large quantities of hot and irritating condiments (chilies and peppers principally) are consumed at every meal.

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[1] The type of banana most familiar to people in the U.S.A.

Some vegetables, boiled or raw, are also included, 262
but in small quantities in spite of abundant supply."

Note that not only has rice been considered much more important as food than "with-rice"[1], but that the diet was more limited for children and young women than for men. The Food and Drug Division of the Ministry of Public Health in Thailand has been trying to encourage people to eat more "with-rice" and less rice. The few comments we heard in relation to rice versus "with-rice" illustrate both the old and the new ideas. One informant stated that only rice can make children fat and that the "hot tasting" foods help them to eat more rice. Another commented that rice makes children strong, and "with-rice" makes them weak. Another, a mother of seven children, said that if babies were given too much "with-rice" they would be potbellied. The more modern view was expressed by an informant who said that a certain child ate only rice with fish and was weak. He refused vegetables and banana. One affluent farmer, an elderly man whose orphaned grandchild was being raised on cow's milk[2], expressed the opinion that the ancient belief was based on thrift. He said that thrifty people did not want to spend much on a baby, therefore, they said that if a child ate too much "with-rice" he would be potbellied but thin in the upper part of the body and that eating eggs would cause dental caries. This grandfather said that he believed the truth to be just the opposite, but that good things were expensive. As an illustration of the idea that thrift was the basis of restriction of "with-rice", one young mother said that an egg was regarded as equivalent to one (1)plaa (1)thuu (a fish), and was enough for two persons. Sometimes one egg would serve an entire family. She said that a child would be punished if he ate a whole egg at a meal.

Summary of Infant Feeding Practices in Bang Chan with Some Suggestions for Improvement.

To sum up the information obtained on baby feeding in Bang Chan, breast feeding was the rule. Some babies were nursed for two years or longer although about two-thirds of those we observed through the weaning period had been weaned by 18 or 19 months of age. Aside from honey which was given with medicine or hot water to newborn babies for a few days only, crushed banana of the (4)nam-(4)waa variety was usually the earliest dietary supplement. By 3 months of age about half the infants were being given banana, sometimes crushed with rice. Between 853 [862]

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[1] In Thai the general term meaning "to eat" is translated literally "to eat rice." Food items are divided into two classes: rice and "with-rice." [R2]

[2] See Footnote, page 25.

853 3 and 6 months soupy rice was a common addition to the infant's diet, and after the first teeth appeared many had rice from the family pot. Between 6 and 9 months, also, fish was given regularly to many babies and egg at least occasionally. Crackers, cookies, and various items designated as (2)kha-(5)nom were frequent additions at this age.

863 Seasonal fruit such as mango and orange was given to some
855 infants from 6 months on, but most children had fruits other
262 than the (4)nam-(4)waa banana infrequently even at two years of age. As the feeding of rice increased, banana was given less often, so that for the 2-year old child even banana was eaten only occasionally. A minority of babies were fed vegetables by one year of age, and some had not begun to eat them by two years. Only about half the children from 2 to 4 1/2 years old had vegetables frequently.

Avoidance of hot tastes, rather than reluctance to give vegetables, may have been responsible for late introduction of vegetables into the diet of many children. In Bang Chan vege-
[252] tables were often combined with other foods, as in curries. They were usually added toward the end of the cooking time after the mixture had been seasoned. Vegetables from such a "hot dish" would not be offered to a small child unless the parents considered him old enough to eat "hot-tasting" foods. Among the mild "with-rice" dishes were vegetables panned with a small amount of fat and seasonings other than chili, as well as vegetables cooked in coconut milk or in water (Hauck et al., 1958; Hauck and Hanks, 1959). In this connection the suggestion of a Thai co-worker that one might encourage eating more vegetables by discouraging the use of "hot" dishes seems promising, since a larger amount of mild than of "hot" "with-rice" food is eaten at one time. To promote more frequent, and earlier, feeding of vegetables to babies, one would need to encourage either more frequent preparation of mild "with-rice" dishes containing vegetables or special preparations of vegetables for the baby. The latter is rather impractical when foods are cooked one at a time over the same fire as in Bang Chan.

[252] Perhaps one reason why most infants in Bang Chan had fish
daily after 6 or 7 months of age is that in making curries fish
[263] was often cooked in a little fat or coconut milk before seasonings were added. Thus, a little fish could then be set aside for the baby before chili and other spices went into the pot. (Note, also, that rice and fish were the foods considered safe to eat
124 during (2)juu (1)faj by all mothers interviewed). Changes in
262 food preparation suggested for improvement of the family diet in general (Hauck, 1958) could automatically help to improve the feeding of young children who are gradually introduced to adult foods. At the same time, a better family diet would probably help to improve the quality and quantity of mother's milk, since during lactation mothers tended to eat as usual. In deciding whether the more effective approach would be through teaching

better nutrition for all family members or whether to concentrate 124
on the feeding of children or other vulnerable groups, 262
the values of the society should be considered. The importance
of a suitable variety of food for health needs to be taught to
adults as well as children in Bang Chan. The concept that
good choice of food is important in pregnancy and lactation
and for the health and growth of children seemed to be entirely
absent. Since few believed certain foods to be harmful at
these times, however, teaching how to choose foods for health
should be easier in Bang Chan than it is in areas where positive
taboos are common.

Behavior different from the traditional one may sometimes 121
lead the way to changed practices among those who observe or 183
hear about it. For this reason, in certain instances an informant 178
who had ventured to deviate from the traditional practice
has been identified in this record. Thus, we noted that in a
number of ways the women school teachers and the wife of a man
teacher deviated from the traditional behavior in Bang Chan.
For example, a school teacher's wife used the hot ashes
chamber after her fifth child rather than lying by the fire.
She was one of two women informants who "ate all kinds of
food" at this time when most women in the community restricted
their diets very markedly. She did not consider taking the
baby out into the sunshine harmful; indeed, she believed it
would make the child stronger. This same mother was 1 of 4
in our series who had taken the baby to be vaccinated against
smallpox. She and three women school teachers were among
those who continued to give their babies boiled water to drink
much longer than was customary in Bang Chan. The one person
who suggested a specific food (eggs) as being good for a woman
to eat during pregnancy was a school teacher. The two women
who planned to go to the Minburi Health Center for delivery
were school teachers. For lack of time after labor began
they did not carry out their plans; but the fact that they
intended to do, by choice, what was usually the last resort
when labor proved long or difficult, may be significant.

Along with these departures from traditional ways and
acceptance of some "modern" practices, the same persons might
cling to other sorts of traditional behavior. The wife of a
school teacher for example, though she thought that taking the
baby into the sunshine might be favorable rather than harmful,
said that if the baby were to be out very long she would cover
its head with a beret to avoid bringing "cold" into the baby.
This same mother took her child to the Minburi Health Center [743]
for treatment for a skin infection, but when the condition did [278]
not clear up immediately after modern therapy was begun, she
took the child to a traditional doctor who prepared a decoction
of herbs with which she treated the baby.

The behavior of respected persons, such as some of the
school teachers, should be influential in helping to bring about

clear evidence of a seasonal effect. If weight gain in Thai 145
infants is related to season, this could be better defined by
weighing groups of children at monthly intervals and determining
when or if changes in rate of gain occur.

Although our records were not made for the purpose of 145
correlating food intake with weight gain, and no quantitative 262
information was obtained on the diets of mothers and babies, we [125]
attempted to see if any obvious relation existed between the
variety of food eaten by the mother or the child and the child's
growth. For this purpose, case studies were made of 7 infants
whose records from birth onward were fairly complete. The age
at last observation was from about 14 to 18 months. Four of
these children had gained at each weighing and weighed more at
one year of age than the average infant observed by Dr. Montri
(1939). Three were chosen because they had lost weight or
failed to gain at some time during the period of observation
and weighed less at one year of age than the average infant
observed by Dr. Montri. Infants of both sexes were included in
each group. No illnesses or abnormalities were recorded in
the clinical histories of any of these babies or their mothers.
No evidence was obtained from the qualitative food records as
to why some infants gained consistently and at a fairly "normal"
rate, whereas others gained relatively slowly and failed to
gain or lost weight at times (Smith, 1958).

Quantitative food records might have provided evidence on
this point but our observations were inadequate for this purpose.
Such quantitative records should include estimations of the
amount of mother's milk obtained by the infants, based on the
baby's weight before and after nursing, as well as records of
supplementary food given. Analysis of the mother's milk, particularly
for the content of the water soluble vitamins which
are influenced by the mother's diet, should also help to shed
light on the cause or causes of the common failure to gain weight
among older infants and small children in Bang Chan. No cases [164]
of beriberi occurred among the infants we observed, but in two [165]
instances siblings had died of infantile beriberi.

Evidence of protein malnutrition has not been commonly 121
recognized in rice eating areas, but one must consider the
possibility that these children may be in a state analagous to
pre-kwashiorkor. Development of the clinically recognizable
protein deficiency disease may be forestalled when the child
learned to feed himself and eats more liberally of rice with
some fish and egg. Of the 54 children with kwashiorkor [262]
observed by Netrasiri and Netrasiri (1955) in Bangkok, many [171]
were weaned earlier than was usual in Bang Chan. Most of them,
however, had been breast fed, and 4 were still being breast
fed when the disease was diagnosed.

b. IF YES: What various things do you do with the polishings?

125
[243]

1.	DA as mill not used	3
2.	Used for feed	99
3.	Used for food	—
4.	They are sold	3
5.	Other, specify________	3
6.	Unascertainable	2

c. ASK ALL: During this past year, did your family eat home-milled rice entirely, in major part, in minor part, or not at all?

[262]

7.	Entirely	5
8.	For major part	51
9.	For minor part	78
X.	Not at all	199

20.a. As you know, some people have had plenty of chance to learn to read, while others have hardly had any chance. How about you yourself? Are you able to read the Thai language, or haven't you ever had the opportunity to do any reading?

[212]

1.	Yes, can read	224
2.	No	109

b. IF R CAN READ: Would you say it is hard for you to read, or easy, or about medium?

3.	Hard	15
4.	Easy	85
5.	Medium	124
6.	Unascertainable	—

c. ASK ALL: Now how about writing? How is it with you yourself? Are you able to write Thai, or haven't you ever had the opportunity to do any writing?

7.	Yes, can write	227
8.	No	106

d. IF R CAN WRITE: How much writing do you do? Are you able to sign your name, or can you also write a letter?

9.	Sign name only	63
X.	Can write letter	163
0.	Unascertainable	1

21.a. Suppose there were a factory in Minburi paying 20 ticals per day. Would you apply for a job to work in this factory?

[464]

7.	Yes	162
8.	No	159
9.	Unascertainable	12

b. Do you think that someone else from your house would apply for a job there?

X.	Yes	105
Y.	No	211
0.	Unascertainable	17

235
was slightly higher than that of chickens, averaging 155 eggs per laying duck.

178 Hogs: In 1949, two families were raising hogs which
231 according to our observation did not seem to be well fed. When we returned to the village in 1952, not a single hog remained in Bangchan.

Fish

262 After rice, fish (and other marine animals) are by
443 far the most important ingredient in the diet of Bangchan.
434 More fish are bought from the outside than the very small amount that is exported from the village mainly by one or two very poor families who have availed themselves of this means of augmenting their income.

221 The villagers' annual cycle for fish-taking varies
226 somewhat with the particular method used, and with the annual rice and ceremonial cycles: yet the maturation cycle of the principal types of fish is also a factor, and one which tends to give an overall orderliness to the annual cycle for fish in general. There is no time in the year when at least some fish are not available, nor is there any time in the year, even the busiest, when the family does not want fresh fish for its menu. For this reason, there is fishing the year round, at least in the form of the housewives simply setting nets in the canal and then tending them according to some schedule or whenever the noise of caught fish sloshing about in the water is heard. When a lull from the pressure of

443 she wanted to spend more time collecting debts."

It should be noted that A's brief duration of peddl-
221 ing started in the harvesting season. During this time the
433
434 village cash supply was high, resulting in demand for such
443 a delicacy as pork which normally constituted a negligible
261 fraction of the diet of Bangchan people. This is a good
262 business period for the peddlers. Another good business
period, although not as good as the harvesting time, is in
the transplanting season, when farmers are too busy to procure their own food (by fishing). In this latter period, farmers are not particular about food, and "anything eatable sells, provided liberal credit is allowed" for people have neither time nor money.

443 It should be noted also that many smaller peddlers did not go to Bangkok as did Nang A. The small peddlers, who operated on a very limited working capital, had to sell their eggs to larger peddlers at discounted prices. Our records show that only three or four peddlers took regular trips to Bangkok.

427 Five families were classified as investors in 1953.
434 All these families lived on rents from land, interest on
454 loans, and income from speculative sources such as buying
621 paddy when the price was low and selling it at high prices.
463 Actually, most of these five families were not among large
426 land owners in the village. Their combined land was only
134 rai, averaging only 27 rai per family and ranging from 10 to 76 rai. This is a small acreage in comparison to

235 Of the 46 families covered by the survey, 23 or one-
433 half raised ducks with an average annual production of 155
434 eggs per duck, and an average of 11.7 ducks per family raising them. Egg production for each of these families thus averaged about 1,800 per year. Of these, 1,350 were consumed by the family and 450 sold at the same price as chicken eggs. It was estimated, then, that from duck eggs alone, the average cash income in 1949 was about 150 baht per family raising ducks.

226 After rice, fish were by far the most important
262 ingredient in the diet of Bangchan. In contrast to poultry,
413 however, fish did not constitute a source of cash income of
[434] the villagers. As a matter of fact, more fish were bought from the outside than the negligible amount that was exported from the village mainly by one or two very poor families who had availed themselves of this means of augmenting
[435] their income. From our consumption study of 106 families in 1953, it was found that of an aggregate amount of 17,786 kilograms consumed by these families in the previous year 16,027 kilograms were caught by the families while 1,759 kilograms were bought at five baht per kilogram. The rate of fish production may thus be estimated at 151 kilograms annually per family, or 44,998 kilograms for the entire village.

262 The same consumption study shows that the 106 fami-
244 lies consumed in 1953 a total of 16,402 kilograms of vegetables
433 all of which were produced or acquired by the families,

438
511 On the other hand, there are scores of items that have to be bought for daily consumption. These are:
[262 (a) Food -- fish, fish sauce, shrimp paste, meat, coconut,
[263
[273 onions, garlic, dried chili, curry essence, limes, tamarind,
[276 palm sugar, white sugar, salt, and cookies: (b) Stimulant --
[512 dried areca, betel, lime, tobacco, tobacco binder, and
[515] liquor; (c) Clothing; (d) Medicine; (e) Soap; (f) Fuel -- Kerosine, matches, charcoal, and fire wood. The list includes only standard items appearing on our check list. Actually, there are more of such items as coffee, tea, lemon-
*[128] ade, coca-cola, and pepsi-cola. Articles that are bought
[272] but do not appear on the check list for ordinary household expenses for certain technical reasons which will be discussed in the section on consumption later in this chapter are building materials, machinery, farm equipment, furniture and household utensils.

The Operator's Remuneration and Measures of Success

000 From almost the beginning of the study of farm management in the United States, much effort has been given to measuring the success of farming businesses, or of farm-family undertakings or enterprises, and then of correlating various factors with these, such as size of business, yields per acre or per animal, or work-efficiency measured perhaps as crop acres per man or per horse or per tractor, with a view to discovering some general farm management principles or rules for a farmer or farm family to follow in becoming more successful. Black, Clawson, Sayre and Wilcox give the

511 expenses (Table 53) and the Thai concept of food taking is somewhat different from the Western concept, an explanation of the food habit of Bangchan residents, which in no way differs from that of Thai farmers elsewhere in the country, is perhaps necessary at this juncture.

* 262
264 By far the most important single dietary item of the Thai is khao or rice, which is the basis for every meal. The general term for "eat" is kin khao which has the literal meaning "to eat rice". Other dietary items are considered as embellishments and are thus called kab-khao (lit., with-rice). Typically, the "with-rice" items contain high seasoning in the form of chili and various hot curries. It is inconceivable for a Thai to eat "with-rice" alone without any rice, for not only the "real food" would then be missing but also there would be nothing to neutralize the highly flavored taste of the "with-rice". Actually, "with-rice" and rice are fed to the mouth in one lump with spoon or hand as the case may be. Eating "with-rice" alone would be just like eating butter without any bread. Moreover, "with-rice" are relatively more expensive than rice. Since the general idea is that they serve only to induce the in-take of rice, for sheer economic reason they should be consumed as little as possible so long as the required amount of rice in-take can be maintained. Accordingly, proper proportion of "with-rice" to rice in each helping has become one of the strictly observed table manners. This is easily noticeable, for only rice is served individually when the

262 family sit at the table while "with-rice" are placed at
264 the center and each person must partake of a small bit of these, just enough to properly go with a spoonful of rice taken each time. This table etiquette is generally observed throughout the country by all classes of people. A story had it that a Thai student of an aristocrat family wrote home objecting to the proposed marriage between his sister and one of his Thai friends in America. One count against the man was that he had been observed to have taken too much "with-rice" while dining out at a Chinese restaurant in New York!

511 Among the factors affecting variability of the rate
182 of consumption of various items of goods, the following may be mentioned:

261 a. Relative price of the food in relation to its
511 ability to mollify hunger when taken with rice. When Bangchan
182 farmers were questioned why they did not consume eggs produced at home but instead sold them and bought the inferior platoo fish (Rastrelliger chrysozonus), the answer was that an egg barely induced them to take a plate of rice whereas one platoo fish bought with half the money obtained from the sale of an egg could induce them to take three or four plates of rice and thus satisfying a hearty meal.

511 b. Homogeneity of quantitative need for certain
182 products like rice, fish, clothing, tobacco, and garlic. Consumption per consuming unit of these goods has been observed to be more or less constant regardless of the prices and the family's purchasing power.

161
434 among these contributing factors is population pressure.

*243 Disguised unemployment in the case of farm operators
161 and their family workers and actual unemployment in case of
434 farm laborers indicates a condition of over-population in
464 Bangchan in the sense that a certain part of its population
can be removed without materially reducing total production
in the area.

178 In view of a continually decreasing supply of fish,
226 it may be said that the situation has reached the point where
433 it not only affects the per capita income of Bangchan
262 residents but actually exerts pressure on means of subsistence.
There are several indications of decreasing supply of fish and other marine animals in the village. First, it is the consensus of opinion gathered by our daily informal talk with villagers non of whom was found to hold a contrary view. Second, a passage in our 1948 log, "X is very lazy. Everybody here in Bangchan catches shrimps and makes his own shrimp paste. He alone does not catch shrimps even though he is among the poorest," indicates that purchase of shrimp paste was in 1948 an exception rather than a rule. In 1952, however, it was found that a total of 22.7 kilograms of shrimp paste consumed in a year by an average family, 6 kilograms, or more than a quarter, was purchased. In this latter year, 83 baht worth of fish and 54 baht of fish sauce were purchased by an average family in addition to shrimp paste as against negligible amounts for the same items in 1948 (we did not conduct a systematic consumption

178 survey in 1948, the "negligible amounts" comes from daily
226 talk with Bangchan residents). Third, several informants
433 [262] testified that the amount of fish caught from the same pool by the draining method had been decreasing each year. One of these gave the following comparative figures for fish caught from the same pool on April 8 - 10, 1953 and on approximately the same time of the year in 1952 as follows:

Kind of Fish	Number Caught in 1953	Number Caught¢ in 1952
Pla Salid	400	800
Pla Salad	100	200
Pla Kasong	50	120
Pla Chado	6	15
Pla Krai	1	--
Pla Doog	50	50
Pla Mor	20	25
Pla Chorn	150	300
Large turtle	5	3
Small turtle	7	3
Eel	5	5

Others also gave the 1953 figures, but could not itemize the 1952 figures; they only said that they "got much more than this year."

226 There had been until 1952 no positive program for
654 fish conservation; only negative measures have been taken, such as the Ministry of Agriculture's ordinance against fishing by certain methods at certain times of the year. In 1952, however, the Government began an extensive program of introducing a new variety of fish, Pla Mor Thed, into rural areas of Thailand. This new variety has been claimed to grow faster than the native varieties. While this program cannot as yet be appraised, a point of observation may be